

ODTÜ:
M.E.T.U.

MİMARLIK
FAKÜLTESİ
DERGİSİ

JOURNAL
OF THE
FACULTY OF
ARCHITECTURE

2023 CİLT VOLUME 40 SAYI NUMBER 1



2023 CİLT 40 SAYI 1
VOLUME NUMBER

Owned by

Sahibi

Neriman ŞAHİN GÜÇHAN

Dean, Faculty of Architecture / Mimarlık Fakültesi Dekanı

Editor

Derleyen

Osman BALABAN

Editorial Board

Yazı Kurulu

Pınar AYKAÇ LEIDHOLM

Ela BABALIK

Osman BALABAN

Olgu ÇALIŞKAN

Çağla DOĞAN

İpek GÜRSEL DİNO

Esin KÖMEZ DAĞLIOĞLU

Mehmet Koray PEKERİÇLİ

Gülşen TÖRE YARGIN

Graphic Design

Grafik Tasarım

Güliz KORKMAZ

Information Technologies

Bilişim Teknolojileri

Ozan BİLGE

Editorial Assistant

Yayın Asistanı

Selen TUĞRUL

Elif KAYMAZ

Oluwaseyi Igbekele ADELEYE

All Correspondence

Yazışmalar

METU Journal of the Faculty of Architecture

Middle East Technical University

Dumlupınar Bulvarı, 06800, Ankara, TURKEY

ODTÜ Mimarlık Fakültesi Dergisi

Orta Doğu Teknik Üniversitesi

Dumlupınar Bulvarı, 06800, Ankara, TÜRKİYE

Tel: (90.312) 210 7038

e-mail: jfa@arch.metu.edu.tr

<http://jfa.arch.metu.edu.tr>

<http://metujfa.arch.metu.edu.tr/>

Online only /Sadece elektronik baskı

METU JOURNAL OF THE FACULTY OF ARCHITECTURE ODTÜ MİMARLIK FAKÜLTESİ DERGİSİ

METU JOURNAL OF THE FACULTY OF ARCHITECTURE

is a biannual refereed publication of the Middle East Technical University published every June and December. The Journal publishes articles contributing to the development of knowledge in man-environment relations, design and planning, which have theoretical or practical significance. Manuscripts, in English or Turkish, have to be approved by the Editorial Board, which are then forwarded to Referees before acceptance for publication. The Board claims no responsibility for the opinions expressed in the published manuscripts. It is assumed that the manuscripts received by the Journal are not sent to other journals for publication purposes and have not been previously published elsewhere. Translation of other authors' works is not accepted. Manuscripts sent for publication should conform to the format outlined in the Writing Manual that is published in the first (June) issue of each volume or that can be found on the Journal website. Starting from 2013 the 'online submission website' <http://metujfa.arch.metu.edu.tr> is available. Authors should submit manuscripts using the online submission system. Manuscripts that are not submitted through the online system, will not be considered for publication.

The METU JFA is indexed / abstracted by the following databases :

ABZU (A guide to information related to the study of the Ancient Near East on the Web); Arthistoricum.net; Arts and Humanities Citation Index (AHCI); Avery Index (AIAP); The British Architectural Library (The RIBA Index, API); DAAI (Design and Applied Arts Index); DOAJ (Directory of Open Access Journals); EBSCOHost Academic Search Complete; Elsevier Scopus; Gale Publishers Group; Intute: Arts and Humanities; Ulrich's Periodical Directory, EBSCOhost Art Source.

ODTÜ MİMARLIK FAKÜLTESİ DERGİSİ

Orta Doğu Teknik Üniversitesi'nin, yılda iki kez, Haziran ve Aralık aylarında yayınlanan hakemli bir yayın organıdır. Dergi, insan-çevre ilişkileri, tasarım ve planlama konularında kurama ve uygulamaya dönük tüm katkılara açıktır. Yazılar, Yazı Kurulu'nun incelemesi ve onayı ile ilgili Hakemler'e gönderilir. Olumlu görüş alınması durumunda yazılar Türkçe ya da İngilizce yayınlanır. Yazı Kurulu, yayınlanan yazılarda yer alan görüş ve düşüncelerden sorumlu değildir. Dergi'ye iletilen yazıların, başka yayın organına gönderilmediği ve yayınlanmamış olduğu varsayılır; çeviri yayınlanmaz. Gönderilen yazıların, her cildin ilk (Haziran) sayısında ve Dergi internet sayfasında yayınlanan Yazı Kılavuzu'na uygunluğu aranır. 2013 yılı itibariyle, Dergimiz yazı başvurularını, internet üzerinden kabul etmeye başlamıştır. Başvurusu internet üzerinden yapılmayan yazılar, MFD Yazı Kurulu tarafından değerlendirmeye alınmamaktadır. Çevrimiçi başvuru sistemine; <http://metujfa.arch.metu.edu.tr> adresinden ulaşabilirsiniz.

ODTÜ Mimarlık Fakültesi Dergisi, aşağıdaki yayın dizinlerinde taranmakta / özetlenmektedir:

ABZU (A guide to information related to the study of the Ancient Near East on the Web); Arthistoricum.net; Arts and Humanities Citation Index (AHCI); Avery Index (AIAP); The British Architectural Library (The RIBA Index, API); DAAI (Design and Applied Arts Index); DOAJ (Directory of Open Access Journals); EBSCOHost Academic Search Complete; Elsevier Scopus; Gale Publishers Group; Intute: Arts and Humanities; Ulrich's Periodical Directory, EBSCOhost Art Source.

© Copyright 2023
ISSN 0258-5316

Middle East Technical University
Orta Doğu Teknik Üniversitesi

Copyright covers the entire content of the Journal. No illustrations may be reproduced without the authority of the owner, holder or photographer.

Telif hakkı derginin tümünü içerir. Dergideki hiçbir görsel belge, gerçek sahibinin, telif hakkı sahibinin ya da fotoğrafı çekenin izni olmadan kullanılamaz.

Cover: Transvaalplein playground, p. 50

Ankara, June 2023
Ankara, Haziran 2023

ODTÜ Mimarlık Fakültesi Dergisi, 2023, 40/1

Yayın Sahibi: (Fakülte adına Dekan) Neriman Şahin Güçhan;

Sorumlu Yazı İşleri Müdürü: Osman Balaban;

Yayın İdare Merkezi Adresi ve Telefonu: Dergi Sekreterliği, ODTÜ Mimarlık Fakültesi, 15E, Çankaya / Ankara, 210 7038; Yayının Türü: Yaygın Süreli; Yayın Aralığı: Yılda İki Sayı; Yayımcı ve Basımcı Kurum: ODTÜ Mimarlık Fakültesi; 30.06.2023

CONTENTS / İÇİNDEKİLER

<i>Editorial / Yazı Kurulu'ndan</i>	iv
<i>Obituary / Anma</i>	
Tansı Şenyapılı	v-xx
<i>Articles / Makaleler</i>	
Fatma ERDOĞANARAS, Kübra CİHANGİR ÇAMUR, Demet EROL, Tuğba ÖNDAĞ Restructuring and New Spatial Tendencies in Ankara Furniture Sector	1-38
Tuğba ÖZER Aldo Van Eyck'in Ara Alan Kavramının Gözden Geçirilmesi	39-58
Melis YEŞİLTEPE, Halime DEMİRKAN Reflection of Empathic Design Process on Interior Architecture Students' Universal Design Solutions	59-82
Melis ÖRNEKOĞLU SELÇUK, Deniz HASIRCI, Ayça TUNÇ COX Co-Design With Children With Cancer: Insights From What They Say, Make, and Do	83-104
Nilüfer BATURAYOĞLU YÖNEY, Scott BRANTING, M. Çıngı SALMAN, Doğan TEKİN, Dominique LANGIS-BARSETTI, Nurçe DÜZALAN SALMAN, Jessica ROBKIN Digital Documentation of the Cappadocia Gate at Kerkenes in Yozgat, Turkey	105-124
Başak YÜNCÜ KARANFİL, Ayşe TAVUKÇUOĞLU A New Approach Changing Expectations From Solid Parts of Building Envelopes: Testing the Carbon Dioxide Diffusion and Retaining Performances of Building Materials	125-150
Aysu BOYSAN, Gülru MUTLU TUNCA Design and Counter Design Against Consumption: 1972 "Italy, The New Domestic Landscape" Exhibition	151-174
Hande SAVAŞ OKUMUŞ, Figen KIVILCIM ÇORAKBAŞ Understanding, Interpreting and Presenting Heritage Sites That Lack Integrity: The Case of the Old Arifiye Village Institute Campus	175-204
Zeynep TUNA ULTAV, Daniele SAVASTA, Meltem Ö. GÜREL Reading Ankara Apartment Balcony Balustrades (1950-75) As Material Culture and Their Digital Documentation	205-226
Kemal Reha KAVAS, Serkan KILIÇ Mimar Turgut Cansever'in Tasarım Düşüncesi Üzerine Antalya Karakaş Camii Bağlamında Bir Çözümleme	227-254

YAZI KURULU'NDAN

ODTÜ Mimarlık Fakültesi Dergisinin Haziran 2023 40(1) Sayısını sizlerle paylaşmaktan ötürü mutluyuz.

Derginin bu sayısında; 28 yazar tarafından 10 yazı sunulmaktadır. Bu yazıların sekiz tanesi İngilizce, iki tanesi ise Türkçe olarak hazırlanmıştır.

2023 yılının ilk yarısında üzücü bir kayıp yaşadık. Şehir ve Bölge Planlama Bölümü öğretim üyelerinden ve 1994-2000 yılları arasında bölüm başkanı olarak görev yapmış olan değerli Tansı Şenyapılı Hocamız aramızdan ayrıldı. Tansı Hocamız gecekondular üzerine yaptığı araştırmalarla ülkemizde bu konunun çok yönlü bir şekilde anlaşılmasını sağlamıştır. Hocamızın Şehir ve Bölge Planlama Bölümünün gelişiminde ve kurumsallaşmasında hem bir öğretim üyesi hem de bir bölüm başkanı olarak önemli katkıları olmuştur. Tansı Şenyapılı Hocamızı saygı ve minnetle anıyoruz.

Bütün yazarlara akademik üretime yapmış oldukları katkıları nedeniyle teşekkür ederiz.

EDITORIAL

We are happy to present the June 2023 40(1) issue of the METU Journal of the Faculty of Architecture.

In this issue; 10 articles are presented by 28 authors. Eight of these articles were prepared in English and two in Turkish.

We suffered a sad loss in the first half of 2023. The loss of our esteemed Professor Tansı Şenyapılı, a faculty member and the former chairperson (1994-2000) of the Department of City and Regional Planning has deeply affected us all. Professor Şenyapılı, as an expert on squatters with diverse field research, not only helped us understand this issue thoroughly but also inspired the conduct of further studies on squatters in Türkiye. Tansı Hoca also made important contributions to the development of the Department of City and Regional Planning, both as a faculty member and as a chairperson. We will remember Professor Tansı Şenyapılı with respect and gratitude.

We thank all authors for their contributions to academic production.



TANSI ŞENYAPILI
1938, 24 Şubat 2023, Ankara

TANSI ŞENYAPILI

Baykan Günay*

Tanışma

Tansi Şenyapılı ile 1963-1971 yılları arasındaki lisans ve lisansüstü eğitim süresinde tanışma fırsatım olmadı. 1971-1981 yılları arasında ise akademik yaşamı hiç düşünmeyen bir meslek insanı olarak gene kendisi ile bir bağım olmadı. Adını belki uzaktan işitiyordum. 1981 yılında sanırım çok rastlantısal olarak ODTÜ Şehir ve Bölge Planlama Bölümünün eleman almak için yaptığı ilan üzerine başvurudum. İlhan Tekeli'ye yaptığım bir ziyarette açılan kadroya alınma şansımın ne olduğunu sordum ve kendisi özellikle tasarım ve somut mekân sorunlarında bir açık olduğunu gözlediklerini ve benden bu alanda görev yapmam beklendiğini ifade etti.

Böylece katıldığım Bölümde Tansi Şenyapılı ile aynı çatı altındaki eğitim yaşantım ben 2012 yılında emekli olana kadar sürdü. Kuşkusuz benden çok önce emekli olmuştu ancak okuldaki eğitim sürecine katkısını sürdürüyordu. İlk göreve başladığım günlerde benden kent merkezleri hakkında bir sunuş istedi. Bunun bir sınama olduğunu hissederek bir hazırlık yaptım ve geleneksel toplumun kasaba çarşısından modern toplumun merkezi iş alanına nasıl evirildiğini, saydamlar ve grafiklerle anlattım. O günkü sınavı başarı ile geçmiştim.

Bilim İnsanı olarak Tansi Şenyapılı

Tansi Şenyapılı gecekondular ile uğraşan ve onun hakkında araştırmalar yapan bir akademik kişilik olarak bilinir. Bu bence eksik bir tanımdır. Kendisi "kentsel coğrafya" alanını kurumsallaştırmış ve öğrencilere yerleşme örüntülerinin bu bakış altında da incelenmesi gerektiğini vurgulamıştır. Bunu önemsiyorum, çünkü gecekondular salt siyasi, iktisadi

ve toplumbilim alanlarının araştırma konusu değildir ve bir şehircilik meselesidir. Bu vurguyu, Tansi Şenyapılı için hazırlanan armağan yayında da yaptım: (1)

Bu çalışma bir kaç yıldır üzerinde düşünüp, yazmaya cesaret edemediğim bir konuya ilişkindir. Konunun ülkemizdeki bilinen isimlerinden olan Tansi Şenyapılı Hocam için bir kitap hazırlandığı ve katkı yapmam istendiğinde kendimde bu cesareti buldum. Gecekondular üzerine yazarlar ve çizerlerin (kötü islah imar planı çizerler dışında pek çizeri yok) bu alana nasıl müdahale edilmelinin yanıtlarını aramadıklarını düşünüyorum. Çoğunlukla toplum bilimlerinden gelenlerin gecekondularla sürekli anlamaya çalıştıklarını, üretilen çözümleri eleştirdiklerini, buna karşın çözüm geliştirmediklerini gözlemliyorum.

Tansi Hocamı bu çerçevede farklı bir yere koyuyorum. Hem iyi bir araştırmacı, hem de çözüm üretmeye çabalayan bir kişiliği olduğunu gözlemliyorum. Ben bir şehir plancısı, ondan da öte bir şehirciyim. Kentin biçimi ve yaşamıyla ilgileniyorum. Gecekondulara bu yönden bakım ve sorun alanını mülkiyet-mekân ve şehircilik ilkeleri açısından irdeledim. Umarım gecekondular uzmanları görüşlerimi hoşgörüle karşılarlar.

Bana bu cesareti veren, Tansi Şenyapılı'nın gecekondularla bir mekânsal olgu ve kentlerin bir sorunsalı olarak görmesi olmuştur. Ne yazık ki konunun bu yönü planlama toplumunda çok net yankı bulmamıştır. Bu süreçte,

1. Baykan Günay; "Gecekondular Ne Oldu? Zilyetliğe Dayalı Kentten – Sahipli Kente", *Gecekondular, Dönüşüm, Kent: Tansi Şenyapılı'ya Armağan*, Derleyenler; Serap Kayasü, Oğuz Işık, Nil Uzun, Ebru Kamacı, ODTÜ Mimarlık Fakültesi Yayını, 2009, (85-112).

* TED Üniversitesi Şehir ve Bölge Planlama Bölümü Başkanı, Prof. Dr.



Eymir'de buluşma. Daha önce de Rauf Beyru'yu anma yazısına koyduğum 1990 civarında çekilen resimde, artık aramızda olmayan Ekmel Derya, Rauf Beyru, Adnan Taşpınar, Raci Bademli ve Mehmet Yılmaz ile Eymir gölündeki öğle yemeği etkinliği sonrası olarak tanımlamışım. Aramızdan ayrılanlara Gülden Berkman ile Önder ve Tansı Şenyapılı da eklendi. (Baykan Günay arşivi)

İlgili bilim ve meslek adamları sanki gecekondulu aynı kalacakmış gibi meseleye bir araştırma konusu olarak bakmışlar, gecekondulu başından beri bir hukuk ve mülkiyet sorunu olarak kentleşmemizin içinde yer alan ve yeni kentsel alanlar yaratan bir olgu olduğu halde bu doğrultuda düşünce geliştirmeyerek hazırlıksız yakalanmışlardır.

Çünkü dönüşümün kurallarını bilimsel çözümler değil, siyasal erk koymuş ve bu alanlarda bir hukuk rejimi oluşturmuştur. Belirsiz bir mülkiyet düzeninden belirlenmiş bir mülkiyet yapısına geçilmiştir ve sonuç, kent üst-biçimi ve kentsel mekân nitelikleri açısından olumsuz olmuştur. Tansı Şenyapılı gecekonduyu tek başına ekonomik, sosyal ya da fiziksel bir olgu olarak değil, bir mekân kurgusu olarak görmüş ve dönüşmeye mahkûm olduğunu bizlere anımsatmıştır.

Görev insanı olarak Tansı Şenyapılı

Tansı Şenyapılı ile olan akademik iletişimimiz, ayrı disiplinlerden geldiğimiz halde sürekli bir denge içinde olmuştur. 1990'lardan sonra ise adım Baykdanış olarak belirlendi ve "50. Yıl ODTÜ'lü Plancılar (1963-2013)" kitabı bitene kadar bu ad sürdü. Bir tarafı işini ciddiyetle yapan bir kişilik diğer tarafı ise dışarı vurmamayan bir duyarlılık kendisini tanımlar diye düşünüyorum. Bu çerçevede eşim Tuba Günay bana sürekli olarak anımsatır; 1988

yılında yakalandığım zatürre hastalığı döneminde Tansı Şenyapılı ve Sevgi Aktüre evimize kadar gelerek bana geçmiş olsun dileklerini ilemişlerdir.

1994-2000 yılları arasındaki bölüm başkanlığı döneminde Bölümü bir arada tutma görevini ciddiyetle ele almıştır. Hiç unutmadığım bir çabayı öğretim üyelerinin çalışmalarını bir arada tutmak için göstermiş ve hepimizin makalelerini/yazılarını fotokopi ile çoğaltarak el kitaplarına dönüştürmüş, bizleri sürekli olarak araştırma ve yayına yönlendirmeye çalışmıştır. Böylece bölüm kendi belgeliğini de oluşturmaya başlamıştır.

Akademik yaşam benim gençlik yıllarımda hiç düşünmediğim bir alan olmuştur. Tansı Şenyapılı, köklerim meslek alanına dayalı olduğu için çok da umursamadığım akademik performansımı yükseltmeye çalışmıştır. Bu çerçevede beni bir yandan doktoramı tamamlamaya özendirirken diğer yandan Kentsel Tasarım Yüksek Lisans Programını kurmam için büyük çaba harcamıştır. Her iki olay da onun zamanında gerçekleşmiştir.

Bölümün kimliğinin yaratılmasında ve tarihinin yazılmasında öncü bir rol oynadığını düşünüyorum. "ODTÜ'lü Plancılar" başlıkları altında derlenen çalışmalar Tansı Şenyapılı'nın Bölüm Başkanlığı sırasında başlatılmış ve bölümün geçmişi belgelenmiştir.



Vişnelik'te emeklilik kutlaması: 03.01.2008
(Baykan Günay arşivi)

İnsan Olarak Tansı Şenyapılı

2007-2008 akademik döneminde 2. sınıf öğrencilerimizle Biga kentinde çalışmalar yaptık. Daha sonra ODTÜ toplumunun da yakından tanıdığı İpek ve Mehmet Gürkaynak'ın konukları olduk. Kendileri beni Biga hakkında bir kitap yazmaya özendirdiler. Bu kitabı (2) imzalayarak Tansı Hocama sundum. Kendisinin bana yanıtı son derecede duyarlı bir kişiliği yansıtır.

Tansı Şenyapılı ile son görüşmelerimiz ODTÜ Şehir ve Bölge Planlama Bölümünün 50. Yılı anısına hazırladığı "50. Yıl ODTÜ'ü Planlılar (1963-2013)" kitabı vesilesiyle oldu. Çalışma, bu kez yalnızca bölümün bireylerine ait bilgileri değil, bu bireylerin yürüttükleri stüdyo çalışmalarını da belgeliyor. Kendi deyişiyle:

"Öğretim üyeleri ve mekân planlıları olarak mesleğimizle ilgili düzgün,

2. Baykan Günay; *Biga: Kenarından Geçilen Kent*, TMMOB Şehir Plancıları Odası Ankara Şubesi, Aydan Yayıncılık Sanayi ve Ticaret A.Ş. Ostim, Ankara, 2011.

26/12/2011

Sayın Hocam,

Biqa'ya iç nedenden ötürü "bayıldım".

- Sizin de bildiğiniz gibi bu ülkede, özellikle de mülhak konusunda arşiv yoktur. Eskiden İller Bankası planı yapılan yerlere kitabını basardı. Onlarda yok oldu ve çöplükte kaldı. Biqa bir arşiv kaynağı ve araştırmacı/plancılar için bu bağlamda çok değerli.

- Dürüğe kadar öğrenci çalışması yapıyor ve bapsi de yok olup gidiyor ve bizler de bu çalışmalara yeterince önem vermiyoruz. Yıllardır hangisiydi ya-larda hangi kendler çalışıldı, bir listesi bile yok. Biqa, Bölüm öğrenci çalışmalarında bir kesit veriyor, bu bağlamda da çok değerli; zira eşi yok.

- Bölümü müz hiç yaygın yapmıyor. Yıllar boyunca planlama/teaserin konularında öncülük yapmış bir Bölüm ama kişisel yayınların ötesinde vizyon, program v.b.-konularında

arbitri sayısı hayli artan benzer bölümlere yol gösterebilecek, (en azından haberler edebilecek) yayını müz yok. Biqa, güzel ve kalbini basımı ile de Bölümü müzi destek edebilir. Umarım tüm şehir ve Bölge Pl. Bölümlerine gider.

Ama ama, hepimizden çok hoşuma giden arka kapak-baki olagan ötesi fotoğraf oldu. Harika bir simbiosis örneği. Yandaki başarıları üstlenmiş bir kızın olagan ötesi bir başka insanın özelliğini gösteriyor. Her bir şey sadece değil.

Ayrıca mızalayış ilettiğini çok teşekkür ederim.

Sevgiler, selamlar.

Tansu Şenyapılı



Tansu Şenyapılı'nın sözünü ettiği resim:
Baykan Günay ve Pelikan; 19.04.2008 (Baykan
Günay arşivi)

sağlıklı derlenmiş ve düzenle saklanmış yazılı ve görsel belgelerin eksikliğini yaşıyoruz. Bu eksikliğini gidermek amacıyla Bölümümüz, eğitime başladığı ilk yıllarda bir “Bölüm Belgeliği” kurdu ve bu belgelik sorumlu öğretim üyelerinin titiz denetimi ve çabasıyla günümüze değin zenginleşerek geldi.”

Tansı Hocamın Biga hakkında bana yazdığı metni bir daha okuyunca çabasını daha net olarak anladım:

“Dünya kadar öğrenci çalışması yapılıyor ve hepsi de yok olup gidiyor ve bizler de bu çalışmalar yeterince önem vermiyoruz. Yıllardır

hangi stüdyolarda hangi kentler çalışıldı, bir listesi bile yok. Biga, Bölüm öğrenci çalışmalarından bir kesit veriyor, bu bağlamda da çok değerli, zira eşi yok.”

Bu çalışmada kendisi ile çokça telefon ve internet üzerinden bilgi alışverişinde bulundum; demek ki son kez haberleşmişiz. Sonuç olarak insanın yaşamında rastlantıların önemli bir payı var. Benim yaşamım da öyle oldu. Hiç planlamadığım bir akademik dünyaya girdim ve Tansı Şenyapılı'nın özendirmeyle kendime yeni alanlar yarattım. Kendisini anarken, kısa zaman dilimlerinde babasını ve annesini yitiren Burcu'ya da sabırlar diliyorum.

ARKADAŞIM TANSI ŞENYAPILI

İlhan Tekeli*

1961 yılı güz döneminde ODTÜ Şehir ve Bölge Planlama Bölümü, Türkiye Büyük Millet Meclisinin arkasındaki prefabrik bir barakada eğitime başladığında, sınıfta benden başka İrem Altan ve Tansı Çalkılıç bulunuyordu. Tansı İstanbulluydu, ben İzmirliydim. İlk kez bu barakada karşılaştık. Önce sınıf arkadaşlığı olarak başlayan ilişkimiz, zaman içinde gündelik yaşamda ve akademik yaşamda ömür boyu bir dostluğa dönüştü.

Küçük bir bölümdük. Üç tam zamanlı öğretim üyesi vardı; Esat Turak, Rauf Beyru ve Gönül Tankut. Her üçü de mimarlık eğitimi üzerine şehir planlama yüksek eğitimi yapmışlardı. Esat Turak ve Rauf Beyru'nun İmar ve İskân Bakanlığında gelen bürokratik deneyimleri bulunuyordu. Bölümün dördüncü kişisi sekreter Can Hersek idi. Bölümün kuruluşu OECD tarafından desteklendiği için ülke dışından gelmiş bir ya da iki öğretim üyesi daha bulunuyordu. Bölümün en etkili hocası sosyoloji bölümünden gelen Mübaccel Kıraydı. Kıray “Kent Sosyolojisi” dersi yanı sıra, bölümündeki ders yüküne rağmen, büyük bir özveriyle tüm stüdyo çalışmalarımıza da aktif olarak katılıyordu.

Sınıf Arkadaşlığımız Nasıl Gelişti?

Bizim sınıfı oluşturan öğrencilerden İrem Altan, ODTÜ'den mimarlık diploması almıştı. Lisans eğitimi sırasında aldığı şehircilik derslerine çok ilgi duymuş, yüksek lisans için yeni

açılan bu bölümü seçmişti. Tansı ise ODTÜ İşletme Bölümünü bitirmişti. Daha sonraki yıllarda çok tanınmış olan Ege Cansen, Muhan Soysal, Ömer Saatçioğlu, Ergün Yener ve Erol Tümer ile aynı sınıfta okumuştum. O sınıfın birincisi olmuştu. Ben ise İTÜ'den betonarme dalından mezun olmuşum. Üçümüz de iddialı öğrencilerdik. İTÜ'de İnşaat Mühendisliği okurken 150 kişilik bir sınıftım vardı. Hocalar büyük amfilerde ders veriyorlardı. Öğrencilerle hemen hemen hiç temasları olmuyordu. Bu öğretim biçimi içinde öğrencilerin eğitime katılımı için hiçbir fırsat doğmuyordu. Onlar büyük ölçüde imtihan edilen yabancıydı. ODTÜ'de ise eğitim çok farklıydı. Üç öğrencilik bir sınıf ve şehircilik eğitiminde merkezi konuma sahip olan stüdyo derslerinde sorunları anlamaya ve çözümler üretmeye çalışırken, hoca ve öğrenci arasındaki sınırların erimesi benim için çok yeniydi. Öğrencilerden katılım isteniyordu. Biz de elimizden geldiğince bunu gerçekleştirmeye çalışıyorduk. Böyle bir eğitim ve bu kadar küçük bir sınıf, öğrencileri bir birine çok yaklaştırıyordu.

Bölge Planlama Dairesinin Çalışanı Oluyoruz

Şehir ve bölge planlama bölümünün bu yıllarında eğitimin en önemli yönünü verilen dersler değil, yaşamın içinden alınmış stüdyo çalışmaları oluşturuyordu. İlk dönem stüdyosunun konusu Kızılay'ın Ulus karşısında bir merkez olarak oluşumunu

* ODTÜ Şehir ve Bölge Planlama Bölümü Emekli Öğretim Üyesi, Prof. Dr.

araştırmaktı. Yaşamımda ilk kez oradaki evlerin kapısını çalarak sosyal anket yaptım. Aynı yılın ikinci döneminde, Massachusetts Institute of Technology (MIT)'de doktora çalışması yapan Granville Seawell ile birlikte Akdere gecekondu bölgesinde saha araştırması yaptık. Ondan sonraki dönemde İnegöl'ün Hayriye köyünde bir köy kalkınması çalışmasına giriştik. İlginçtir, bu çalışma 60 yıl sonra Kalkınma Atölyesi tarafından bir kitap halinde yayımlandı. Bizim eğitim aldığımız 1960'lı yılların ilk yarısında, Türkiye'de planlamaya inanç çok yüksekti, adeta bir kurtuluş yolu olarak görülüyordu. Biz de eğitimimizi bu moral yüksekliği içinde sürdürüyorduk.

Ben, şehir ve bölge planlama eğitimini sürdürürken, Milli Savunma Bakanlığında askerliğimi yapıyordum. Terhis zamanım geldiğinde İmar ve İskân Bakanlığı Bölge Planlama Dairesi Başkanı, bana Zonguldak Bölge Planını yönetmeyi önerdi. Tabii bu öneri henüz bir öğrenci için çok heyecan vericiydi. Ama bugünden geriye baktığımızda o yıllarda planlama alanında yetişmiş kişi eksikliğinin ne kadar vahim bir noktada olduğunu gösteriyor. Hemen bölge planlama dairesi çalışanlarından ve proje için yeni alınacaklardan genç bir ekip kurduk. Bu ekipte sınıf arkadaşım Tansı Çalkılıç ve onun erkek arkadaşı Önder Şenyapılı da bulunuyordu. Ayrıca OECD kanalıyla gelen biri fiziki plancı, diğeri ekonomist iki yabancı uzman daha vardı. Bu ekip Bakanlıkta mesai saatlerine tabi olmadan gecenin ileri saatlerine kadar birlikte çalışıyorduk. Biz bölge planlama dersi almamıştık, bölge planlama daire başkanının odasında Walter Isard'ın Methods of Regional Planning kitabını bulmuştuk. Ondan yararlanıyorduk. Yabancı uzmanların kapasiteleri bize yol göstermekte yetersiz kalıyordu. Gece gündüz çalışan bu grup bir yandan altı ay sonunda planı tamamladı, öte yandan yüksek lisans tezlerini tamamladılar. Hazırladığımız Zonguldak Ön Planı 1964 yılında yayımlandı.

Bu sıcak çalışma ortamı içinde Tansı, Önder, Sudi İlkorur ve ben sık sık Mübaccel Kıray'ın Milli Müdafaa Caddesindeki evini ziyaret etmeye başladık. Biz Zonguldak Planını yaparken o da Ereğli çalışmasını yazıyordu. Bu ziyaretler kısa sürede düzenli toplanan "Cuma Gecelerine" dönüştü. Bu gecelerde İbrahim ve

Mübaccel Kıray'ın yaptıkları yemekleri yiyor, haftanın siyasal olaylarını tartışıyor, o hafta oynayan filmleri, yayınlanan kitapları yorumluyorduk. Ankara'da buldukları haftalarda Yaşar Kemal, Ruhi Su, Behice Boran da bize katılıyordu. Biz bu gecelere rahle-i tedris demeye başladık. Bu sevgi çevresi hepimizin yetişmesine büyük katkı yapıyordu. Bu dönemde uzun süredir arkadaşlıkları süren Tansı'yla Önder İzmir'de evlendiler. Nikâh şahitlerinden biri de babamdı.

Zonguldak Ön Planının yayınlanması Bakanlıkta bize olan ilgiyi çoğalttı. Bakanlık önemli gördüğü konularda bizi görevlendirmeye başladı. Doğunun Kalkınması o yılların en önemli konusuydu. Zonguldak ekibi önce bu konuda araştırma yapmakla görevlendirildi. Birlikte tüm doğu illerini kapsayan uzun süren bir yolculuk yaptık. Doğu gerçeğini tanıdık. Bundan sonra Gaziantep Organize Sanayi Bölgesi çalışması yapmakla görevlendirildik. Bir aydan fazla Gaziantep'te kalarak bir araştırma/plan hazırladık. Artık birbirini ve kapasitelerini yakından bilen, güven duyulan bir araştırma ekibi haline gelmiştik.

Bölge Planlama Dairesinde çalışanlar projelerde çalıştıktan sonra OECD bursuyla bilgi ve görgüsünü artırmak için yurt dışına gönderiliyordu. 1965 yılında ben MIT'ye gönderildim. Bir dönem orada kaldım ve yazın ABD'de önemli kurum ve projelere gitmem sağlandı. 1966 güz döneminde de Pennsylvania Üniversitesine Walter Isard'ın Bölge Bilimi Bölümüne giderek yüksek lisans eğitimi görmeye başladım. Ben bu bölümdeyken Tansı ve Önder'in de yurt dışına çıkması sırası gelince, onlar da bu bölüme geldiler. Tansının uçak fobisi olduğu için, gemiyle New York'a geldiler, sonra Philadelphia'ya geçtiler. Tansıyla bir kez daha sınıf arkadaşı olduk. Ben 1966 yılında, onlar da 1967 yılında Türkiye'ye döndüler.

Bu yolculukların karşılığı olan mecburi hizmetlerimiz bulunuyordu. Bölge Planlama Dairesinde çalışmaya başladık. İzmir Caddesindeki bir apartmanın farklı dairelerinde kalıyorduk. Evlerimiz Bakanlığa yürüyüş mesafesindeydi. Akşam yemeklerimizi sık sık Piknik'te ya da Mehmet Kemal'in Kalem Restoranında yiyorduk. Bu dönemde 1961 Anayasası Türkiye'de sol

düşüncenin gelişmesine kapıyı açmıştı. Türkiye İşçi Partisi Mecliste temsil ediliyordu. Sol yayınlar artmıştı. Türkiye solun ne olduğunu öğreniyordu. Biz de bu açılıma duyarlı kalıyor, bu konuda yaşanan gelişmeleri izlemeye çalışıyorduk. Mübeccel Kıray'ın 12 Mart 1971 sonrasında emekli olup İstanbul'a yerleşmesine kadar "Cuma Gecelerine" devam etmeyi sürdürüyorduk. Bu geceler yaşamımızı anlamlı kılıyordu. Biz ABD'den döndüğümüzde bölge planlama konusunda çok iyi teçhiz edilmiş bulunuyorduk. Artık, Bakanlık bizden daha iyi yararlanabilirdi. Ama Bakanlıktaki hava değişmişti. Sağ bir iktidar gelmişti. Tuğrul Akçura, Sudi İlkorur sürgüne gönderilerek istifa etmek zorunda bırakılmıştı. Biz sürgüne gönderilmedik ama işlerin başında olarak görünmemiz istenmiyordu. Bu durum bana doktoramı yazmak için zaman sağlamıştı.

Hoşdere 18'de Plan Oba Apartmanını Yaptırıyoruz

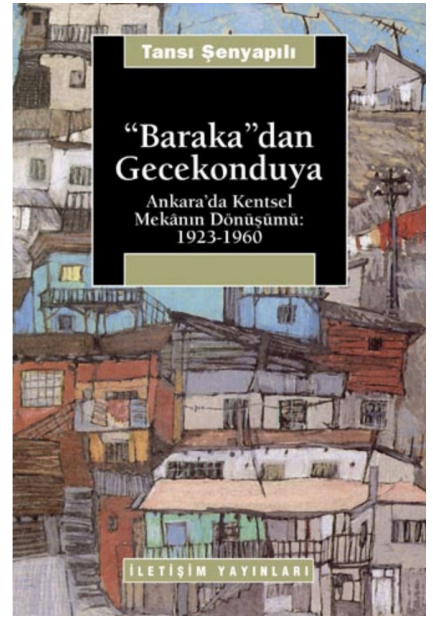
Bu durumda ilgimiz planlamadan kendimize konut yaptırmaya yöneldi. Bölge Planlama Dairesinde çalışanlar ve Devlet Planlama Teşkilatından olan arkadaşlar bir araya gelerek, SSK'nin verdiği kredilerden yararlanarak, Ayrancıda Hoşdere 18'de 16 dairesi bir apartman yaptırıldı. Bu apartmana Plan Oba adını verdik. Bu girişimin başını Yılmaz İnkaya çekiyordu. Bu iddialı bir projeydi. Türkiye'nin Birinci Kalkınma Planında, konut yatırımlarında tasarruf yapılması önerilmişti. SSK da çıkardığı

konut yönetmeliğinde, kredi vermek için yapılacak konutların büyüklüğüne 63,5 m²'den büyük olmama koşulu getirmişti. Türkiye'de büyük konut yapma alışkanlığı olduğundan, bu büyüklük sınırına toplumda yoğun bir itiraz bulunuyordu. Biz de plancılar olarak, iyi planlanmış bir binada, iki çocuklu bir ailenin rahatça yaşayabileceğine inanıyorduk. Bunu Plan Oba örneğinde gösterecektik. Yanlış hatırlamıyorsam 1968 yılında bu apartmana taşındık. Hoşdere 18'de Tansı ve Önderin ve benim birer katımız vardı. Ben bekârdım ama kat sahiplerinin önemli bir kısmının iki çocuğu bulunuyordu. Çocuklarını bu katlarda rahatça büyüttüler. Günümüzün birbirine yabancı ailelerinin oluşturduğu apartman yaşamından farklı bir yaşantı biçimi geliştirmeyi başardık. Her hafta sonu birlikte eğleniliyor, birlikte yemekler yiyorduk. Apartmanın usta aşçıları, Yılmaz İnkaya, Tülin Candır, Erdoğan Soral ustalıklarını yarıştıyordu. Hoşdere 18 kiskanılan bir apartman haline geldi. 63,5 m² büyüklük sınırı insanların mutlu bir yaşam kurmasının engeli haline gelmiyordu. Şimdi Bilkent'te öğretim üyesi olan Tansı ve Önderin kızları Burcu da bu apartmanda doğdu.

Hoşdere 18 bir bürokratlar apartmanıydı. Ecevit'in başbakan olduğu hem 1973, hem de 1977 yılı sonrasında CHP iktidarı yeni bir kadrolaşmaya giderken, Hoşdere 18'de oturanlar ilk akla gelenler arasında yer almaya başlamıştı. 1977 yılında üst



Sevgi Aktüre, Gülden Berkman, Tansı Şenyapılı ve Sevin Osmay kampüste, Sevin Osmay arşivi.



Tansî Şenyapılı'nın gecekondu üzerine yaptığı araştırmalarından ürettiği bazı kitapların kapak görselleri.

düzeyde 7 bürokrat burada yaşıyordu, sabahları çok sayıda siyah araba apartmanın önünden kalkıyordu. Burada Tansî ve benim dışımda, Gencay Şaylan, Oktar Türel, Erdoğan Soral, İlbiçe Saldamlı da doktoralarını yaptılar. Ali Türel de Hoşdere 18'de kiracı olarak yaşamıştı. Bürokratlar apartmanı akademisyenler apartmanına dönüşmüştü. 1980'de ORAN'da 11 Evlere taşındım. 1971 Yılından itibaren Tansî, ODTÜ Şehir ve Bölge Planlama Bölümünde öğretim görevlisi olarak çalışmaya başladığından, benim taşınmam dostluğumuzda önemli bir kesinti yaratmadı. O hastalanıncaya kadar da ilişkimiz sürdü.

Tansî Şenyapılı Akademik Yaşama Giriyor

Tansî ODTÜ'de çalışmaya başlayınca akademik kariyerini oluşturmaya başladı. Ankara Üniversitesi Siyasal Bilgiler Fakültesi'nde Cevat Geray'la doktora çalışması yapmaya başladı. Bu sırada İngiltere'deki Center for Environmental Studies'den sağladığı bir araştırma fonuyla 1974-1976 yılları arasında İstanbul'da beş ayrı gecekondu bölgesinde saha araştırması yürüttü. Bu araştırmanın Gültepe gecekondu bölgesindeki sonuçlarını değerlendirerek 1977 yılında doktora derecesini aldı. Bu çalışma bir yıl sonra ODTÜ Mimarlık Fakültesince "Bütünleşmemiş Kentli Nüfus Sorunu" adıyla yayınlanmıştır. Tansî, bu çalışmada kentte ucuz ve devingen emeğin var olabilmesinde gecekondu

olgusunun çok yönlü katkısının neler olduğu üzerinde yoğunlaşmaktadır. Bütünleşmeyi emeğin devingenliğiyle açıklamaktadır.

Doktora tezini verdikten sonra yardımcı doçent unvanı ile öğretim üyeliğine terfi etmiştir. Tansî değişik kuramsal dersler vermiştir. Ama onunla özdeşleşeni üçüncü sınıf stüdyosu olmuştur. Özcan Altaban, Haluk Alatan ve Murat Güvenç'le birlikte yürütülen bu stüdyo dersi, öğrencilere tasarım faaliyetinin bilimsel araştırmayla ilişkisinin kurulmasında ve planlama ahlakının kodlarının oluşturulmasında bir referans noktası oluşturmuştur. Tansî, İstanbul araştırmasını tamamladığında 1981 yılında "Gecekondu Çevre İşçilerin Mekânı" isimli kitabını yayınlanmıştır. Doktora tezini geliştirdiği bu çalışma onun doçentlik tezi olmuştur. Kentteki işler; merkez işler, çevre işler ve marjinal işler olarak üçe ayrılmakta, gecekonduların ne merkez ne de marjinal işlerin yeri olduğu ama temelde çevre işlerin yeri olduğu anlatılmaktadır. Tansî, gecekondu için geliştirdiği bu kuramsal çerçeveyi, Türkiye'deki gecekondu olgusunun gelişimini dört döneme ayırarak, bu farklılaşmanın nedenlerini açıklamakta kullanmaktadır.

Tansî'nin üçüncü kitabı, 1981 yılında TÜBİTAK'tan aldığı bir araştırma fonu sonucunda yazdığı "Ankara Kentinde Gecekondu Gelişimi (1923-1960)" başlığıyla 1985 yılında Kent-Koop tarafından yayınlandı. Bu çalışma, 1986 yılında Sedat Simavi Sosyal Bilimler

Ödülünü aldı. Bu çalışmanın gözden geçirilmiş bir versiyonu 2004 yılında "Barakadan Gecekonduya" başlığıyla İletişim Yayınlarından çıktı. Tansı, bu kitabın ana yayın olarak gösterildiği başvurusuyla 1989 yılında profesör unvanını aldı. Kısa bir süre sonra da 1991-1994 yılları arasında Kent Planlama Programının Başkanlığını, 1994-2000 yılları arasında da Şehir ve Bölge Bölüm Başkanlığını yükledi. Bölüm başkanlığı sırasında bölüm yönetiminde belli bir disiplini getirmek, yeni kadrolar geliştirmek için çok uğraş verdi. Bu arada beni bölümde verilmiş yüksek lisans tezlerine "İlhan Tekeli Tez Ödülü" vermeye teşvik etti ve 1996 yılından sonra bu ödülü yönetti. Şimdi bu ödül öğrencilerimin kurduğu İlhan Tekeli Şehircilik Kültürü Vakfınca genişletilerek sürdürülmektedir.

Tansı'yla aramızda dört aylık bir yaş farkı var. Ben 2004 yılında emekli oldum, o da 2005 yılında emekli oldu. Her ikimiz de derslerimizi sürdürdük. Ben her pazartesi gelip doktora dersimi veriyordum. O Önder'le birlikte her

gün üniversiteye geliyordu. Benim geldiğim pazartesi günleri öğle yemeklerini öğretim üyelerinin sosyal kulübünde yiyorduk. Genellikle masada Özcan Altaban, Tansı, Önder ve ben oluyorduk. Masamıza zaman zaman başka emekliler de katılıyordu. 62 yıl gözlediğim üzere Tansı ve Önder birbirine yetiyordu. Onları küçük şeyler mutlu ediyordu. İyi bir çikolata yanında yenilen bir dondurma ya da pasta yanında seyredilen iyi bir film onları mutlu etmek için yeterliydi. Tansı, çalışma alanlarını seçerken de benzer şekilde davranıyordu. Benim gibi her alanla ilgilenmiyordu. İlgisini ve çalışmalarını gecekondu sınırlıyordu. Türkiye'de yapılmakta olan gecekondu araştırmalarını ve yapılan tezleri izliyor, onları mutlaka edinmeye ve okumaya çalışıyordu. Ben gecekonduyla ilgili bir soruyla karşılaştığımda ona soruyordum. Yazdığı yazıları hep bu alan içinde tutuyordu. Bu alanın sahibi gibi davranıyordu. Bir anlamda 2023 yılında onu kaybettiğimizde gecekondu konusu da öksüz kalmış oldu.

TANSI HOCAMIZIN ARDINDAN

Pınar Türker*

Tansı Hocamızın vefatını öğrendiğimde ülkemden kilometrelerce uzakta ofisimde çalışıyordum. Sevgili arkadaşlarım Nil Duruöz ve Emine Yetişkul sayesinde hissettiklerimi yazıya dökme şansım oldu ve uzaktan da olsa Hocamızın İlhan Tekeli Şehircilik Kültürü Vakfında düzenlenen anma törenine bir şekilde katılabilmiş gibi hissettim. Yine sevgili arkadaşım Osman Balaban beni hatırlayıp Tansı Hoca için bir yazı göndermek isteyip istemeyeceğimi sorduğunda ilk işim bu anma yazısına eşlik edecek fotoğrafları aramak oldu. Fotoğraf kareleri dün gibi aklımda ama ne kadar arasam da bulamadım çünkü hayatımın diğer yarısının arşivi Türkiye'de, her bir parçası başka bir evde. Fotoğraf bulamasam da akademik çalışmalarımı buldum ve bunların arkasında hep Tansı Hocamız var. Sevgili Osman, Nil ve Emine Hocalarıma çok teşekkür ederek başlamak istiyorum çünkü hala ODTÜ'nün bir parçası olduğumu hissettirmeleri benim için çok değerli. Ve artık bizi duyamayacak olsa da Tansı Hocama emekleri için sonsuz teşekkürlerim ve kalbimde bir sızıyla bu yazıyı kaleme alıyorum.

Eşim Demir Deveciğil ile birlikte 1995 yılında ODTÜ Şehir ve Bölge Planlama Bölümünden mezun olduk. Biz 20 senedir yurtdışında yaşıyoruz ve Tansı Hocamızı anmak demek bizim için geriye dönüp kendi hayatımıza da bakmak anlamına geliyor. Çünkü bugünümüze damgasını vurmuş uzun bir ODTÜ geçmişimiz var ve Tansı Hocamız da ODTÜ deyince ilk aklımıza gelen isim. Üzerimizde çok emeği var.

1991 yılında ODTÜ Şehir ve Bölge Planlama Bölümüne ilk adımımı attığımda danışmanımı Tansı Hocam. Sonra defalarca kapısını çalacağım, uzun saatler geçireceğim odasında ilk tanıştığımız gün bana "mimarlık isteyip de kendini burada bulanlardan mısın" demişti gülererek. "Bilmem" demiştim ben de. Ne istediğimi bilmediğim zamanlardı. Çok iyi hatırlıyorum; "şehir planlama da ne ki" diye dolandığım günlerdi ve odasından çıktığımda hala "şehir planlama ne ki" desem de bende öğrenmeye dair bir merak oluşturmuştu. Şimdi yıllar geçti, başka bir ülkede hala şehir plancısıyım ve işimi severek yapıyorum.

* ODTÜ Şehir ve Bölge Planlama Bölümü Eski Araştırma Görevlisi; Dr.



ODTÜ Şehir ve Bölge Planlama Bölümü öğretim üye ve elemanları Fakülte dekanlık girişinde birarada, 90ların sonları.

Tansı Hocanın kaç dersinde öğrencisi oldum hatırlamıyorum. Ancak üçüncü sınıf ve Denizli stüdyo çalışmaları kişisel tarihimize damgasını vurmuştur. Tansı Hocanın kritikleri, Murat (Güvenç) Hocayla şakalaşmaları, Demir'in mor spor ayakkabılarını çok beğenmesi ve her şeye gülen çocuklar olarak koca sene mor ayakkabılarla dalga geçmemiz hepsi beni gülümseten anılar şu anda.

Mezun olduktan sonra ODTÜ Kentsel Politika Planlaması ve Yerel Yönetimler yüksek lisans programına devam ettim ve o sıralar Şehir ve Bölge Planlama Bölümü Başkanıydı Tansı Hocamız ve ben de genç asistanlardan biriydim. O zamanlara dair (1990'ların sonu) bir bölüm resmimiz var.

Tansı Hocamız o zamanlarda bir şehir plancıları albümü hazırlanması çalışmasını yönetiyordu. Emek ve zaman gerektiren bir işti ve sanırım asistanlar sırayla katkı veriyordu. O albümü bir araya getirenlerden biri olarak sıra bana geldiğinde bitmek tükenmek bilmeyen format değişiklikleri için o zamanlar çok söylendiğimi hatırlıyorum ama bugün o albümü her elime aldığımda "iyi ki" diyorum ve tabii ki Tansı Hocanın titizliği geliyor aklıma.

Asistanlıkta bir sürü sene geçirirken hocamızın bana verdiği akademik emekler saymakla bitmez. Hocamız detaylara önem veren titiz bir akademisyendi ama aynı zamanda çok pratikti. Bitmek bilmeyen master tezimi "gel bir konuşalım" deyip pratikliği ile nihayet bir yola koymamı sağlayan odur. Danışmanım Prof. Dr. Korel Göymen idi ama Tansı Hocam ile yaptığım tartışmalar gerçekten "*Impact of Planning and Urban Actors on Urban Water Management: The Case of Ankara*" master tezimi şekillendirmiştir.

Tansı Hocam 1998-2003 yılları arasında süren doktora çalışmalarında danışmanım oldu. O benim danışmanım olmasa doktora tezimi zor bitirirdim. Ne zaman dağılsam konuyu benim için öyle bir daraltırdı ki görünmez bitişler nihayet görünür hale gelirdi. Tezimin son zamanlarında ben ODTÜ'den ayrılırken "bir daha düşün" demişti bana. Bir daha düşünmeyerek 2002 yılında Başbakanlık Konut Müsteşarlığında çalışmaya başladım ama sonra pişman da oldum. Dikmen Vadisinde yaşayan insanların evlerini ziyaret ettiğim, çay içip, börekler yiyip Tansı Hocayla belirlediğimiz soruların cevaplarını sohbetlerin içerisinde almaya çalıştığım çok değişik zamanlarda



Tansı Şenyapılı'nın dönemin bölüm araştırma görevlileriyle birlikte büyük emek ve özveriyle hazırladığı "ODTÜ'lü Plancılar" albümlerinden birinin kapak görseli.

Tansı Hoca, içinde kaybolduğum karmaşık bilgi yığınına akademik tecrübesi ve pratikliği ile bir teze dönüştürebilmem için bana hep destek oldu. 2003 yılında "*An Agent-Oriented Approach to the Analysis of Urban Transformation Process: Ankara-Dikmen Valley within the Context of Sustainable Urban Development*" adlı doktora tezimi sonuçlandı.

Doktora tezinin ardından, *European Journal of Public Policy* ve *International Planning Studies* isimli dergilerde yayınlanan "*Urban Transformation Projects as a Model to Transform Gecekondu Areas in Turkey: The Example of Dikmen Valley – Ankara*" ve "*The Role of Local Actors in Transforming Informal Settlements in Turkey for Sustainable Urban Development: The Ankara–Dikmen Valley Case*" başlıklı iki makalede benim

ABSTRACT

IMPACT OF PLANNING AND URBAN ACTORS ON URBAN WATER MANAGEMENT: THE CASE OF ANKARA

Türker, Pınar Aypek
M.S., Urban Policy Planning and Local Government
Supervisor: Assoc. Prof. Dr. Korel Göymen

May 1998, 218 pages

This study considers the question of urban water management as a part of urbanisation process and examines the impact of planning and urban actors on urban water management in terms of efficiency, accountability and equity. Within this context, urban water supply mechanisms in Turkey is examined within four periods that indicate distinct urbanisation characteristics in relation to planning institutions and consumer behaviours. Thus, institutions that undertake direct roles in water supply mechanisms are considered as primary actors of urban water management; planning institutions and consumers that indirectly affect urban water provision are considered as secondary actors of urban water management. This study aims to emphasise the importance of secondary actors in urban water

ABSTRACT

AN AGENT-ORIENTED APPROACH TO THE ANALYSIS OF URBAN TRANSFORMATION PROCESS: ANKARA-DİKMEN VALLEY WITHIN THE CONTEXT OF SUSTAINABLE URBAN DEVELOPMENT

Türker-Devecigil, Pınar Aypek
Ph.D, Department of City and Regional Planning
Supervisor: Prof. Dr. Tansı Şenyapılı

June 2003, 361 pages

Especially over the last decade, the sustainability concept is offered as the solution to most problems associated with human interaction with the natural environment and the concerns about the concept of sustainable development have led to many diversified views in terms of urban development. Despite the vagueness that the concept involves, substantial areas of agreement over the concept of urban sustainability have developed both at the national and international level, as well as in different disciplines. Therefore, the sustainable urban development with its related concepts sustainability, livability and equity has prominent impact on urban planning theory and practice.

This research has been focused on an analysis of the urban transformation process in Dikmen Valley within the context of the concepts: sustainability, livability and equity. It has examined the involvement of a wide range of the urban agents in this process, the relational networks they constructed and the ways in which they took part in this process. The approaches of the urban agents towards the environmental, economic and social dimensions of urban development that underpin the notions of urban sustainability constitute the bulk of the subjects that are to be examined in this research. The contextual characteristic of the urban sustainability debate constitutes the main theme of the research with reference to the urban development process in Dikmen Valley.

Keywords: Sustainable urban development, urban agents, sustainability, equity, livability, quality of life, urban renewal, squatter development, environment



TANSI ŞENYAPILI

ODTÜ Şehir ve Bölge Planlama Bölümü'nden Şehir Planlama Yüksek Lisans derecesini, Philadelphia Üniversitesi'nden Bölge Planlama Yüksek Lisans derecesini ve Ankara Üniversitesi, Siyasal Bilgiler Fakültesi'nden doktora derecesini aldı. 1971 yılında ODTÜ Şehir ve Bölge Planlama Bölümü'nde öğretim üyesi olarak çalışmaya başladı. Yurtiçi ve yurtdışında çeşitli dergi ve kitaplarda yayımlanan yazılarının yanı sıra *Bütünleşmemiş Kentli Nüfus Sorunu*, *Gecekondu 'Çevre' İşçilerin Mekânı* ve *"Baraka"*dan *Gecekonduya* başlıklı kitapları vardır.

[Tansı Şenyapılı] yaşamı boyunca toplum açısından anlamlı bir soruna sadık kalmıştır. Bu olguyu izleyerek değişimleri saptamış yeni yorumlar geliştirmiştir.

İlhan Tekeli

Tansı Hocamı bu çerçevede farklı bir yere koyuyorum. Hem iyi bir araştırmacı, hem de çözüm üretmeye çabalayan bir kişiliği olduğunu gözliyorum.

Baykan Günay

Tansı Şenyapılı'nın öncü çalışmalarından, toplumsal değişme sürecinin çok yönlü dinamiklerinin ipuçlarını gecekondulaşma sürecini gözlemleyerek izlemenin mümkün olacağı anlaşılmaktadır.

Sema Erder

Sevgili hocam Prof. Dr. Tansı Şenyapılı'nın, ODTÜ Şehir ve Bölge Planlama Bölümü'nde gerek lisans gerekse yüksek lisans öğrenciliğim sırasında, uzunca bir dönem asistanlığını yaptığım yıllarda ... gecekondu çalışmalarından nasıl büyük bir keyif aldığına tanık olmuştum.

Sezai Göksu

Tansı Şenyapılı'nın 1984 yılında Sedat Simavi Sosyal Bilimler Ödülü'nü alan *"Baraka'dan Gecekonduya"* başlıklı çalışması] ... Türkiye'de kent ve gecekondu araştırmaları literatürünün temel eserlerinden biridir.

İletişim Yayınları



ODTÜ Mimarlık Fakültesi 2009 / METU Faculty of Architecture 2009

GECEKONDU, Dönüşüm, Kent TANSI ŞENYAPILI'ya armağan



GECEKONDU Dönüşüm, Kent



TANSI ŞENYAPILI'ya armağan

Serap Kayasü, Oğuz Işık, Nil Uzun ve Ebru Kamacı tarafından derlenen 2009 tarihli *"Tansı Şenyapılı'ya Armağan"* kitabının ön ve arka kapak görseli.

ismim yazsa da bu yayınlar aslında Tansı Hocamla yaptığımız doktora çalışmalarımızın bir sonucudur.

O yüzden hocamın anısına çıkarılan *"Gecekondu, Dönüşüm, Kent"* adlı armağan kitabında Hocamla yaptığımız çalışmaların Türkçe özeti niteliğindeki *"Kentsel Dönüşümün Aktörleri ve Sürdürülebilirlik: Dikmen Vadisi Örneği"* adlı çalışmamla yer alabilmiş olmaktan her zaman mutluluk duyacağım.

Sadece akademik değil, kişisel konularda da Tansı Hocamı anmadan geçemem. Ailevi sıkıntılarda, zor zamanlarımda, nişanlılık ve evlilik gibi güzel zamanlarımızda hep eli değdi bize hocamızın. Demir'i özellikle çok severdi. Askerden döndüğünde benim kadar sevinmiş; "ne duruyorsunuz burada. Palet Pastanesine gidip cheesecake yiyin" diye şakadan kovalamıştı bizi bölümden. Hatta doktora tezim bittiğinde Demir'e özellikle teşekkür etmişti, bana destekleri için...

Yıllar sonra bölüme çocuklarımızı getirdiğimizde çok güzel sohbet

etmiştik. "Hep dönersiniz diye düşünüyordum ama artık dönmezsiniz" demişti. "Yok Hocam döneneceğiz" dedim ama hala dönemedik işte. O yüzden bugün çok çok uzaklardan anıyoruz kendisini. Bunca yılın bu kadar çabuk geçmesinin şaşkınlığı ve ODTÜ Şehir ve Bölge Planlama Bölümünü Tansı Hocamız hiç düşünmemiş olmanın verdiği buruklukla...

Benim için ODTÜ Şehir ve Bölge Planlama Bölümü yıllar öncesinde donmuş haliyle bir anı şimdi. O yüzden Tansı Hocamı omuzlarında şalı ile odasında kitaplarının önünde, masasında çalışırken hatırlayacağım hep. Sanki gitsem orada bulacaktım gibi, diğer tüm hocalarımla, arkadaşlarımla, gençliğimizle birlikte...

Emekleri için gönülden teşekkür etmeye geç kalmasaymışız keşke. Ve dediği gibi Dikmen Vadisinin kitabını vaktiyle yazsaymışız.

Mekânı cennet olsun, Nur içinde yatsın...

* Bursa Teknik Üniversitesi Şehir ve Bölge Planlama Bölümü Başkanı, Doç. Dr.

PROF. DR. TANSI ŞENYAPILI: ÖĞRENMEKTEN ASLA VAZGEÇMEYEN CESUR BİR KADIN

Ebru Kamacı Karahan*

Tansı Hoca ile ilk görüşmemiz, şimdi fark ediyorum da ismini yanlış söylememek için içimden es veriyorum hala, CRP301 Planlama Stüdyosu dersinin asistan kadrosuna dâhil olduğuma dair haberin ardından "tanışalım" diyerek beni odasına davet etmesi ile oldu. ODTÜ'deki ilk ayımdı ve daha önce akademik çalışmalarını yakından takip ettiğim bir hocanın, Tansı Şenyapılı'nın karşısında oturmak ve onunla karşılıklı konuşma fırsatı bulmak benim için çok kıymetliydi. Hocanın karşısında kendimi anlatmaya çabalarken yüzümün kızarması sanki dün gibi. Bu tarihten sonra, Tansı Hoca, Hocam, yol göstericim ve men torum olarak hayatımda hep oldu ve olmaya devam edecek...

Hoca ile derse girmek, yakın çalışmak, sadece mesleki anlamda bilgi edindiğiniz değil kendinize nasıl bir akademisyen olacağınıza ilişkin sorular sormanıza da neden olan bir deneyim sunar. Buna ilişkin sayısız anı arasından, asistan olarak girdiğim ilk stüdyo dersinde bana dediklerini hala hatırlarım: "gözlem yapmalısın,

başarılı bir araştırmacı/akademisyen olmak istiyorsan dikkatlice ve tarafsızca gözlem yapmalısın. Ancak böylelikle olman gereken kişi olabilirsin". Sonrasında sıkı sıkıya bağlı kaldığım ve yıllar boyunca birçok farklı durumda ve zamanda doğruluğunu ispatlayan bu tespit, hâlihazırda akademiye yeni giren birçok meslektaşına anlattığım anekdotların arasında yer alıyor, hatta başında geliyor.

Diyebilirim ki, Tansı Hocanın öğrencileri ile kurduğu bağ çok sağlam ve içtendir. Her ne kadar yaş haddinden emekliliğinin yaklaşmasından dolayı teknik olarak doktora tez hocam olarak atanamasa da bu zorlu süreçte danıştığım kişilerin başında gelmiştir. Özellikle tez yazım sürecinde fikirlerimin temizlenmesi ve odaklanmam gereken anlarda, kendisine hiçbir kredi verilemeyeceğini bilmesine rağmen, kendi çalışma prensipleri üzerine inşa ettiği mantığı benimle paylaşmış ve bu mantığı işletebilmem için gereken yardımı da esirgememiştir. Fakat Tansı Hoca ile çalışmak sadece kendi meslek alanına ilişkin değil fizik başta olmak üzere birçok farklı disiplinle ilişki görüş alışverişi yapabilmek anlamına da gelir. Karşınızda inanılmaz bir öğrenme merakına sahip, öğrenmekten asla vazgeçmeyen cesur bir kadın vardır. Siz de bu sohbet sırasında, benim sıklıkla yaptığım gibi yeni terimleri not edip, hangi kitapların okunabileceğine, hangi filmlerin izlenebileceğine ilişkin bilgi ile donanırsınız ve bir sonraki görüşmenize kadar en azından bunlardan birini okuyup/izleyip hoca ile karşılıklı sohbet edebilmeyi hedefleyerek odasından ayrılırsınız.

Daha önce de ifade ettiğim gibi, sadece akademik alanda değil hayatın birçok farklı bağlamında öğrencileri ile sağlıklı iletişim kurabilen bir akademisyendir Prof. Dr. Tansı Şenyapılı. Doktora derecemi aldıktan sonra hoca ile çizdiğimiz yol haritasını takip etmeye çalışıyorum. Bazı duraklarda tahmin ettiğimden fazla duraklamış olsam da emin adımlarla yürümeye devam ediyorum. Ve yine arzuladığımız gibi olmasa da Kedi Briç'e başladı...

Tansı Şenyapılı ve Sevin Osmay Fakülte bahçesinde, Sevin Osmay arşivi.



PROF. DR. TANSI ŞENYAPILI**Ali Türel***

* Çankaya Üniversitesi, Şehir ve Bölge Planlama Bölümü Öğretim Üyesi, Prof. Dr.

Prof. Dr. Tansı Şenyapılı, ODTÜ Şehir ve Bölge Planlama Bölümünün gelişmesine önemli katkılar yapan bir hocamız olmuştur. Bölümde eğitimin nitelikli ve düzenli yürütülmesine öğretim üyesi ve yönetici olarak yönlendirici etkilerinin yanı sıra kentleşme ve kentsel alanlarla ilgili yürüttüğü araştırmalar ve araştırma sonuçları üzerindeki yayınlarıyla bölümde bilgi üretimini etkileyip zenginleştirmiştir.

Tansı Şenyapılı ve değerli eşi Önder Şenyapılı ile 1970-1972 yılları arasında Yukarı Ayrancı, Hoşdere Caddesi No. 18 adresindeki apartmanda komşu olmuştuk. İlhan Tekeli Hocamızın da oturduğu bu apartmandaki komşuluklarımız, ben doktora sonrası 1981 yılında ODTÜ Şehir ve Bölge Planlama Bölümünde göreve başlayınca bölüm meslektaşlığına dönüşmüştür. Bu yazıyı, kendisiyle bölümdeki görüşmelerimizde olduğu gibi "Tansı Hanım" hitabıyla sürdüreceğim. ODTÜ'deki çalışma hayatımda destek ve önerilerini her zaman mutlulukla hatırlıyorum.

Tansı Hanım Türkiye'de gecekondular üzerine yaptığı ayrıntılı çalışmalarla bu konudaki tanım ve kavramların geliştirilmesinde başta gelen isim olmuştur. Sıklıkla vurguladığı bir husus, gecekondunun yapımı bitmiş bir yapı olmadığıdır. Hanehalkının ihtiyaçları, belediye zabıtalari ve yasaların sağladığı olanaklar, kira

geliri elde etmeye olanak sağlayacak eklenti yapmanın mümkün olması gibi nedenlerle gecekonduya yatayda ve dikeyde eklentiler yapılabilmektedir. Bir araştırmasından elde ettiği verilerle, gecekonduların eklenti şekilleri planlar üzerinde tanımlanmıştır. ODTÜ Şehir ve Bölge Planlama Bölümünde yürütücüsü olduğu iki yüksek lisans tez çalışmasında; öğrencilerinin Ankara'nın Karşıyaka semtindeki gecekondularda, 1984 yılında yasalanan 2981 Sayılı İmar Affı Kanunundan önce çok katlı yapıya dönüşümleri incelediklerini hatırlıyorum. Tansı Hanım, eklentilerle genişletilebilmesi nedeniyle gecekondunun "esnek" bir yapı olduğunu sıklıkla vurgulamıştır.

Tansı Hanım, gecekonduyu bir yapı olarak inceleyip değerlendirirken, köyden kente göçüp gecekonduda yaşayan nüfusun kentteki sosyal ve ekonomik yönlerden değişim ve gelişmesini de incelemiştir. Köyden göç eden nüfusun kentteki ilk dönemlerde işgücü piyasasındaki konumunun "marjinal işgücü" olarak tanımlanabileceğini yazılarında belirtmiştir. Zaman içinde sosyal ilişkilerinin gelişmesine paralel olarak "enformel" olarak isimlendirilebilecek, kurumsal düzenlemelerin bulunmadığı işlerde genellikle kayıt dışı çalışılmaya başlandığını anlatan bulgular, araştırma sonuçlarını özetleyen yazılarında yer almıştır. Tansı Hanım, köyden kente göçen nüfusun işgücü piyasasında



Tansı Şenyapılı, Sevin Osmay ve Gülden Berkman Fakülte'de birlikte, Sevin Osmay arşivi.

DEVELOPMENT OF ISTANBUL METROPOLITAN AREA AND LOW COST HOUSING

**İlhan TEKELİ, Tansı ŞENYAPILI, Ali TÜREL
Murat GÜVENÇ, Erhan ACAR**

**Turkish Social Science Association
Municipality of Greater Istanbul
IULA-EMME - International Union of Local Authorities,
Section for the Eastern Mediterranean and Middle East Region**

Istanbul, 1992

erişmeyi amaçladığı konumu, “formel” işlerde, kayıtlı ve sigortalı olarak çalışmaya başlamak şeklinde tanımlamıştır. Bu üçlü gelişme aşamasını, kişilerin girişimleri ve sosyal ilişkilerinin gelişmesinin yanı sıra, dönemlere göre de değerlendirerek, toplumsal gelişme ve ekonomiyle ilgili politikalarla da ilişkilendirmiştir.

Kanada'nın *International Development Research Center* (IDRC) isimli kurumu tarafından sağlanan bir araştırma fonu ile finansmanı sağlanan ve 1980'li yılların ikinci yarısında İstanbul'da gerçekleştirilen bir araştırma projesinin sonuçları; İlhan Tekeli, Tansı Şenyapılı, Ali Türel, Murat Güvenç ve Erhan Acar tarafından kitap haline getirilmiş ve 1992 yılında “*Development of Istanbul Metropolitan Area and Low Cost Housing*” başlığıyla yayınlanmıştır. Bu çalışmada Tansı Hanım, İstanbul'un Zeytinburnu semtinden başlayıp batı yönünde

uç alanlarına kadar uzanan kesimde örnek seçtiği gecekondularında gerçekleştirdiği araştırmaların birinci bölümünde; gecekonduların yapılış süreci, yapısal nitelikleri, kullanılan kaynaklar ile düşük fiyatlı apartman konutuna dönüşümleri ve konutlarda oturan nüfusun sosyal ve ekonomik özellikleri gibi konuları incelemiştir. İkinci bölümde ise araştırmanın yöneldiği ilginç konu, kentin uç alanlarında yer alan, özellikle tekstil üretimi yapılan işyerlerinde çevredeki gecekondularda yaşayan kadınların çalışma durumu ile üretimin bir bölümünün gecekondularda gerçekleştirilmesi olmuştur.

Tansı Hanım, gecekondunun 2981 sayılı kanun uyarınca yasallaştırılıp onaylanan ıslah imar planları uyarınca gerçekleştirilen parsellasyon planlarıyla oluşturulan parseller üzerinde 4 kata kadar apartman inşa edilerek dönüştürülmesini incelediği

bir yazısında, gecekondunun “esnek” yapıdan “donuk” apartmana dönüştüğünü belirtmiştir. Aynı yasal çerçevede gecekondunun apartmana dönüşümünü Ankara'nın Yıldız Mahallesi örneğinde incelediği bir başka yazıda ise konuyu kentsel rantların paylaşımı açısından değerlendirmiştir. Yıldızevler gecekondular mahallesinde gerçekleşen dönüşüm sürecinde; kamuya dönmesi gereken kentsel rantların, yapsatçı ve gecekondular sahipleri tarafından paylaşıldığını ya da araziye işgal edenler tarafından dondurulduğunu, bu rant paylaşımında, yapsatçıların bir adım önde giderek dönüşümün yönü, hızı ve biçimini belirlediklerini vurgulamıştır. Gecekonduların yerine çok katlı lüks konut siteleri ile yapsatçı eliyle apartmanların inşa edildiğini, apartmana dönüştürülemeyen çok az sayıda gecekondunun kaldığını da vurgulamıştır. Satış fiyatları oldukça yüksek olan yeni inşa edilen konutların, gecekondular sahiplerini değerli mülk sahibi yaparken yapsatçılara da yüksek karlar bıraktığı, işgal edilmiş olan kamu arsalarının bu süreçte kamuya yeterli getirilmesinin olmadığı da vurgulanmıştır.

Tansı Hanım, Ankara'da ruhsatlı konut alanlarının gelişmesini mekânsal olarak ve içinde yaşayan nüfusun özelliklerine göre ayrıntılı olarak incelediği bir yazısında, demiryolunun kuzeyi ve güneyinde inşa edilen konut alanlarına kentin farklı bölgelerinden sosyal ve ekonomik bakımlardan farklılaşan nüfusun taşındığını, yeni konut alanlarına taşınan orta ve alt gelir gruplarının boşalttığı alanlara daha alt gelirli hanehalklarının yöneldiğini belirtmiştir.

Tansı Hanımın, konut ağırlıklı çalışmalarından söz edilen bu yazıda, başta gelen araştırma konusu olan gecekondunun yapımı ve dönüşümünde tarihsel süreçteki değişimi inceleyen yayınlarında ele alınan konular ve başlıca bulguları kısaca özetlenmiştir.

Sayın Prof. Dr. Tansı Şenyapılı ile ODTÜ Şehir ve Bölge Planlama Bölümünde birlikte çalışmış olmaktan büyük kıvanç duyuyorum. Aziz hatırası önünde saygı ile eğiliyorum.

RESTRUCTURING AND NEW SPATIAL TENDENCIES IN ANKARA FURNITURE SECTOR (1)

Fatma ERDOĞANARAS*, Kübra CİHANGİR ÇAMUR**,
Demet EROL**, Tuğba ÖNDAĞ

Received: 11.06.2021; Final Text: 12.05.2023

Keywords: Spatial restructuring; new technologies; furniture industry; agglomeration; Ankara.

1. This study is based on the results of the master's thesis titled "Restructuring of the Furniture Industry and Its Spatial Consequences: The Case of Ankara" conducted by Tuğba Öndağ at Gazi University, Institute of Science and Technology, Department of Urban and Regional Planning in 2019. Based on the comments of the referees, the paper has been substantially revised. During this revision process, the method, data used, and findings have been extensively renewed. Thus the resulting article has evolved into a significantly different study. The results of the original research can be seen in the following papers: Erdoğanaras and Öndağ (2016), Erdoğanaras and Öndağ (2018).

INTRODUCTION

The implementation of export-led growth policies in the 1980s engendered the growth of local industries in Turkey. Among the beneficiaries of the policies was the Turkish Furniture Industry. The Turkish Furniture Industry has since experienced remarkable growth according to Eastern Mediterranean Development Agency Report (2014). For instance, Wang (2019) indicated that among the countries that exported furniture to less developed countries between 2009 and 2013, the Turkish Furniture Industry ranked third only behind Mexico and China. Overall, the industry's growth trend as captured by Trade Map (2016) showed an upward progression from 29th amongst exporter countries in 2005 to 14th in 2015. As a result of this growth, the Turkish Furniture Industry employed 229,915 individuals in 2016 and made a 3.6% contribution to global furniture production, amounting to US\$12.5 billion in the same year. As Türkiye continues to consolidate its position as a strong actor in the global furniture industry, the need to document the trend of production and spatial change engendered by the industry's transition to new technologies, arises.

Large metropolitan areas provide significant competitive advantage to industries with a high degree of uncertainty and product diversity such as furniture (Erdil et al., 2008; Scott 2008a, 2014; Müderrisoğlu and Kortan, 2015). In the Turkish scenario, the furniture industry has developed in areas such as Istanbul, Bursa, İzmir, Kayseri, Ankara, etc. This is because, innate to these large metropolitan areas is their propensity for technologically-driven restructuring, access to raw materials, and high market concentration (TÜİK, 2017). Figures from TÜİK (2017) show that in 2017, İstanbul (13%) and Ankara (6%) ranked 1st and 2nd in the furniture industry apropos the numbers of firms in Türkiye. Additionally, in terms of employment, İstanbul (20%), Bursa (14%) Kayseri (12%) and Ankara (8%) ranked 1st, 2nd, 3rd and 4th respectively in Türkiye's furniture industry. However, regarding technological inauguration, the Ankara Furniture

* Corresponding author; Department of City and Regional Planning, Faculty of Architecture, Gazi University, Ankara, TÜRKİYE.

** Department of City and Regional Planning, Faculty of Architecture, Gazi University, Ankara, TÜRKİYE.

Industry has experienced notable increase in the number of firms that have introduced computer-aided design and manufacturing systems in their production process since the mid-2000s.

This achievement sets Ankara Furniture Industry apart from its counterparts in Türkiye's furniture industry. For this reason and among others earlier mention, Ankara is considered for this study.

The Ankara Furniture Industry has experienced significant restructuring in recent decades. As with other aspects of human society, factors like globalization, information, communication and technological advancement, and expansion in global market precipitated the change. Yet, while the industry has experienced an increase in productivity over the years, it did not escape the negative externalities of urbanization due to its location within Ankara. Needless to say, the furniture industry in Ankara became predisposed to urbanization's fallouts, such as rising demand for land, increased value of land, congestion, and environmental problems. Plagued by these developments, coupled with their growth, the industry retreated production activities to less populated (un)organised city peripheries of Ankara leaving only retailing activities behind. These locational shifts effectuated obvious changes in spatial reformation within and around the city of Ankara. However, documentation of such changes remains sparse in literature.

Inspired by the scarcity in literature on the impact of technology-based restructuring process on spatial projections/reflections within Türkiye's furniture industry, this study analyses spatial restructuring resulting from the adoption of new technologies underscoring Ankara Furniture Industry. More precisely, this study investigates furniture firms in the agglomeration areas of Sıteleler, Sincan and Akyurt in Ankara that either renewed or failed to renew their technologies to obtain information of the use of new technology on spatial area. Accordingly, this study takes a discursive and qualitative approach to understanding the phenomenon under study. Data gathered included an in-depth interview conducted on 80 firms that renewed their technology in Sincan, Akyurt and Sıteleler, and 40 firms that failed to renew theirs in Sıteleler.

The paper has four substantive sections after this introductory part. Section II presents a conceptual framework summarizing the role and spatial effects of new technologies in restructuring processes specific to developing and developed countries. Section III explains the methodology adopted for the study. Section IV presents the dynamics of restructuring based on technological development in Ankara Furniture Industry. The focus was to establish a link between production organisations, labour processes and labour market, and the effects of these processes on spatial projections. Finally, Section V concludes the study by offering the spatial tendencies of the restructuring process of Ankara Furniture Industry based on the research findings.

THEORETICAL AND CONCEPTUAL FRAMEWORK: INDUSTRIAL RESTRUCTURING PROCESS BASED ON NEW TECHNOLOGIES

Theoretical and Conceptual Overview

Evolutionary Economic Geography (EEG) reveals the spatial development and transformation of firms, industries, networks, cities, and regions through the processes of establishment, development, closure, and

relocation of firms (Frenken and Boschma, 2007). In an earlier declaration, Martin and Sunley (2006) argued that EEG recognises that current economic geography abets the future development and transformation of past industrial and institutional growth. Boshma and Martin (2007) identified two basic concepts in contemporary economic geography that explains the transformation process of the production, distribution and consumption spaces of economic geography over time; Path dependency and Lock-in. Furthermore, they emphasised the subservience of 'Lock-in' to 'Path dependency,' indicating that large firms, research institutions and human capital constitute the core determinants of breaking out from lock-in. Evident from related literature is that arrays of trajectories and strategies are deployed within these two basic concepts during the restructuring processes.

According to Kalleberg (2003), two main trajectories, which can be used separately or in combination, dictate how firms realise restructuring strategies in the global competitive environment. Firstly, firms adopt a 'high path' trajectory during restructuring by renewing their technologies and implementing high-performance business organisations to increase competitiveness. As against the first, 'low path' –being the second trajectory– rouses competitiveness of firms by reducing labour costs without investing in technology. To sidestep lock-in situation by firms during restructuring, firms employ various strategies such as new technological investments, investing in new units and facilities, expending on machinery and other equipment, mergers and acquisitions, downsizing, and building strategic industrial and commercial alliances. Beside these strategies, Hudson (2005) also stakes a claim for information technologies as another potent strategy since it facilitates firms' networking capacities and improve their ability to coordinate between geographically dispersed firms. In sum, knowledge and technological innovations are indeed key factors in the development of industrial firms. Still, it is worth stating that industrial restructuring strategies vary considerably across industries and countries.

To exemplify Faust et al.'s (2004) elicitation that "continuous reproduction and diffusion of innovation throughout the economic processes are important for the development of industries and regions," the economic geographies of developing countries reflecting restructuring processes based on new technologies and spatial transformation are spotlighted. For example, Hassink and Shin (2005) in an empirical study of the steel and coal mining complex in the Ruhr Region, Germany, used path dependency and lock-in to explain the negative aspects of clusters underlining the decline (loss of competitiveness) of old industrial areas. Additionally, the researchers defined spatial relocation as another alternative restructuring strategies against economic lock-in. Similar studies like Schamp (2005), Hadjimichalis (2006), Yuan et al. (2014) and Zhang et al. (2018) laud relocation as one of the most dynamic components of industrial zone restructuring

Since the 1970s, "economic restructuring and spatial transformation" has been an important area of discussion in literature. Especially after 2000, economic geographers have become increasingly interested in economic transformation and industrial restructuring. In economics literature, spatial patterns of industrial activity are usually shaped by economies of agglomeration and scope, economic diversification, and incentives in industrial policies. Since industrial areas are integral parts of urban

structure, geographers emphasise that they are affected by myriad of factors at different spatial scales. For example, institutions and government policies, land availability and prices, accessibility, proximity to labour, and market size. Granted, the restructuring of regional economies has a long tradition in Europe (Bull, 1978; Imrie, 1989; Glasmeier, 1994; Norton and Rees, 2007; Hassink, 2007; Bertacchini and Borrione, 2013; Miller, 2017; Bellandi et al., 2018), it is a relatively new phenomenon in developing countries, especially in Asia (Balaban, 2001; Kaplinsky et al., 2002; Shen and Wu, 2013; Gao and Yuan, 2017; Yuan et al., 2017; Wu et al., 2018; Zhang et al., 2018; Fu et al., Yang, 2012,2020; Li et al., 2022).

The spatial restructuring of industrial production areas has been characterised by the Post-Fordist transformation of cities. This manifests in the decisive shift from material-intensive manufacturing to high-tech production, management, logistics, service, design, and cultural industries in both Europe and the United States since the 1970s (Gereffi, 1997; Scott and Storper, 2015). This process, according to Scott (2001), results to a dense clustering of capital, labour, and social life in urban areas. Typical of the dense clusters are complex connections that facilitate capital flow and firm migration. And with accelerating industrialisation and urbanisation, industrial development has been migrating towards the suburbs from city cores. Suburbs have become attractive locations for capital, technology, and global production networks (GPNs) due to cost advantages (Yeung, 2009; Yeung and Coe, 2015; Coe and Yeung, 2015). Consequently, peripheral suburbs are assuming the roles of new production areas for firms migrating from city centres.

This shift from city centres within metropolitan areas to peripheral suburbs in the process of industrialisation is what is termed restructuring of production areas. In the world over, metropolitan areas that underwent the processes of industrialization characterized by a shift in production areas from city centres to peripheral suburbs have been largely restructured to exhibit significant urban and regional dimensions. For example, the major driver of restructuring in Western economies has been the dynamics of local investing firms and the development of their domestic markets (Renski, 2008). However, in their Asian counterparts, the development of global markets has significantly imparted cities' restructuring. This is because since the early 1980s, Asian cities have been important recipients of foreign investment (Firman, 1998; Li et al., 2022). Moreover, these developments in Asian countries are more state-oriented than in their Western counterparts. To put it rather succinctly, Yang (2012) enounced that the proliferation of suburbanisation of industry in developing countries has fostered the relocation of firms from their first agglomeration areas in cities; and export-oriented firms are leading the process. Although, it is the large firms using new technologies that are mainly determining the restructuring process (Doms et al., 1995; Martin and Sunley, 2006).

In view of the aforementioned concepts, figure 1 illustrates restructuring process based on new technologies. Thereafter, the subsequent paragraphs discuss the globalisation of the furniture industry premising restructuring triggered by new technologies as well as the spatial consequences of the restructuring processes.

Globalization of the Furniture Industry and New Technologies

In recent years, the use of new technologies in traditional labour-intensive and high-tech industries have intensified. For clarity, high-tech

SPATIAL RESTRUCTURING OF FURNITURE FIRMS

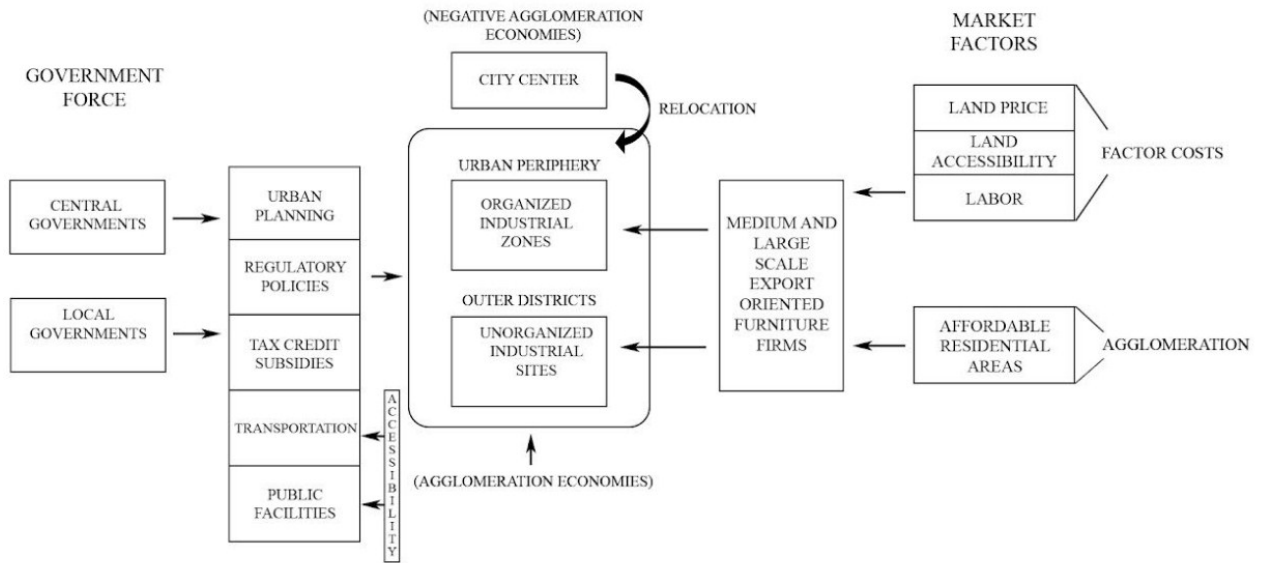


Figure 1. Restructuring process of industrial areas based on new technologies (prepared by authors)

industries are manufacturing industries with Research and Development R&D intensity above 3% of total output value (equivalent to high-tech and medium-high tech manufacturing industries in the OECD (2005) classification). Paradoxically, these traditional industries are the biggest customers of technology-producing high-tech industries (Hansen and Winther, 2014). The 1970s marked the inception of using new technology in the restructuring process for industries in developed countries (Wang, 2019). Moreover, the quantum leap accelerated in the 1990s and more recently, resulting in a high level of mechanization and automation that extends to various industries, including the furniture industry. This include the intensive use of Computer Numerical Control (CNC) machines and artificial intelligent robots in the global furniture industry. Attaining this feat has made furniture products modern and industrialized. Yet, revelations from existing literature are that furniture production is less globalised compared to other labour-intensive industries like footwear, clothing, etc. This, citing Wang (2019), is due to factors like low value-to-mass ratio, cumbersomeness and heaviness in comparison to value, high cost of transport, easy susceptibility to damage during transport, and cultural product.

Notwithstanding, the introduction of new technologies in the industry has aided the emergence of innovative products that can keep pace with the ever-changing styles and diverse demand (Wang, 2019). For example, changes in demography and lifestyle in the world (increase in single-person families), industrial shifts in production (i.e. from manufacturing to services), increase in home-office workers, and advertising of furniture as a lifestyle and value are all factors that catalysed the adoption of new technology in the industry. Additionally, new technologies through advertisement campaigns that displays the eclectic composition of furniture have aided manufactures to transform furniture from commodity to fashion (Leigh, 2000, Leslie and Remier, 2003; 2006). Computer-aided

design (CAD), computer-aided engineering (CAE) and computer-aided manufacturing (CAM) constitute the predominant technologies used in the furniture industry. While CAD/CAM software helps in programming machines to perform specific tasks, CAD/CAE software aid products' design, and improve the quality and performance of machines as well as products.

Other technologies include CNC machines, local or wide area computer networks (LAN/WAN), manufacturing resource planning (MRP) software. As per functions, LAN/WAN facilitates the flow of information while MRP manages inventory, procurement and production logistics. Furniture firms also use computers to guide movement of parts and products during production phase thereby increasing automation in the process. This reduces the cost of production by enabling quick changes to production lines within the shortest time possible (Drayse, 2011). As observed in literature, furniture firms in developed countries (for example, Canada, United States, etc.) especially large ones in the furniture industry, has had their standard furniture parts made overseas in countries like, China, Taiwan, Malaysia, Vietnam, etc., during the course of their restructuring process. Typically, the firms in the overseas countries are subcontracted by parent firms in the developed countries to produce imports in a strategic alliance characterized by a flow of support to the delegated firms. Pondering on the arrangement between parent and subcontracted firms, a mutually beneficial relationship is said to take place. The small-scale firms using advanced technology and improved skilled labour force produce high value-added products for niche markets dominated by the parent firms (Robb and Xie, 2003; Carpona et al., 2006; Hirsch-Kreinsen, 2008, Robb et al., 2008; Scott, 2008b; Drayse, 2011) while the parent firms keep production request coming.

Spatial Effects of the New Technologies in the Furniture Industry

Depending on the scale of firms, organisation, and the of development level of countries in which the firms are located, restructuring processes based on new technologies produce different spatial results. These outcomes are particularly inspired by industries with low-technology and low-skill industries such as furniture. For instance, while technology-intensive and fashion-oriented industries seat within the internal production areas in developed countries, their traditional manufacturing counterparts are either confined to lower tier cities in urban hierarchy or sited in other countries offering cheap labour (Scott, 2009). Industries in developing countries mobilise the advantage of new technologies and restructuring to get more share from the new international division of labour in the furniture industry. Their strategy of export-oriented production ensures they remain competitive in the furniture industry. Therefore, as developing countries increase production capacities, simultaneously, production becomes concentrated in new agglomerating and clustering areas in metropolitan (Scott, 2006).

As foregrounded earlier, spatial behaviours of firms vary under the influence of new technologies. To underline this variation, the study examine small-scale, labour-intensive, and vertically disintegrated firms, as well as, large-scale, capital-intensive, and vertically integrated firms. In small-scale, labour-intensive, and vertically disintegrated firms, spatial agglomeration and clustering tendencies are mostly notable. Low-tech and low-skilled industries like the furniture industries, regardless of the countries' level of development, manifest agglomeration tendencies. This,

in large part is because the interrelated production with dense production networks allows for product diversification during production process. Production is relatively small-scale and prone to vertical integration, and the firms constituting the networks are composed of highly specialised and complementary firms. Besides, the endogenous economies of scale in the industry are limited due to the high uncertainty in end-product markets. In production centres where such networks are concentrated, firms are located at the centre of gravity of the labour pool (Scott, 1988; Storper, 1997).

Spatial agglomerations are also intensified by the combination of institutional arrangements that provide social coordination and management, and interactive learning among producers. These factors generate positive externalities that offers competitive advantage (Fan and Scott, 2003). Even though spatial agglomeration is explained by firms locating in the same place, the cluster approach in Porter (2000) stressed that such spatial coexistence is not just enough. Accordingly, Porter (2000) argued that there should be complementarity and partnership relations between specialised firms, through infrastructure and information flow that supports the success of firms. In other words, the cluster concept refers to local relationships between small and medium-sized firms specialised in different stages of the production chain. In essence, agglomeration and clustering are considered to be spatial strategies that increases the competitiveness of furniture firms in the globalising world while also enabling their success (Scott, 2006; Wang, 2019).

In contrast to small-scale, labour-intensive, and vertically disintegrated firms, their large-scale, capital-intensive and vertically integrated counterparts develop internal economies of scale. The efficiency attain through this therefore allows standardisation in these firms. Since large producers are less dependent on firms they are linked with in comparison with small and medium-sized firms, they can move to other preferred areas that offer significant advantages. Scott (2006) identified cheap land, low-wage labour force, and access to transportation facilities as some of the advantages. Hence, due to the low variability of their external relations, the large firms migrate production to locations outside the existing agglomeration areas (Scott, 2006).

To sum up, production in low-technology and low-skill industries is predominantly carried out by small, medium-sized and large-scale firms, which can be either organisationally and spatially separated or integrated with other firms in both developing and developed countries. Generally, they are organised and clustered in a network that indicates agglomeration informed by new production technologies for the purpose of competitiveness and solidarity (Scott, 2006). The spatial distribution of firms shaped by the impact of new technologies exhibits great diversity across different parts of the global geography. In the case of Canada, design and sales-oriented stores are located in city centres while their production sites are located in the suburbs. For cities in Italy like Milan for example, furniture industries have developed in small settlements with a design-oriented and craft background outside the metropolitan areas (Bertacchini and Borrione, 2013). Also, in the case of Danish industries, while sales stores are located in big cities, production firms choose to locate in small towns in the metropolitan areas (Wang, 2019).

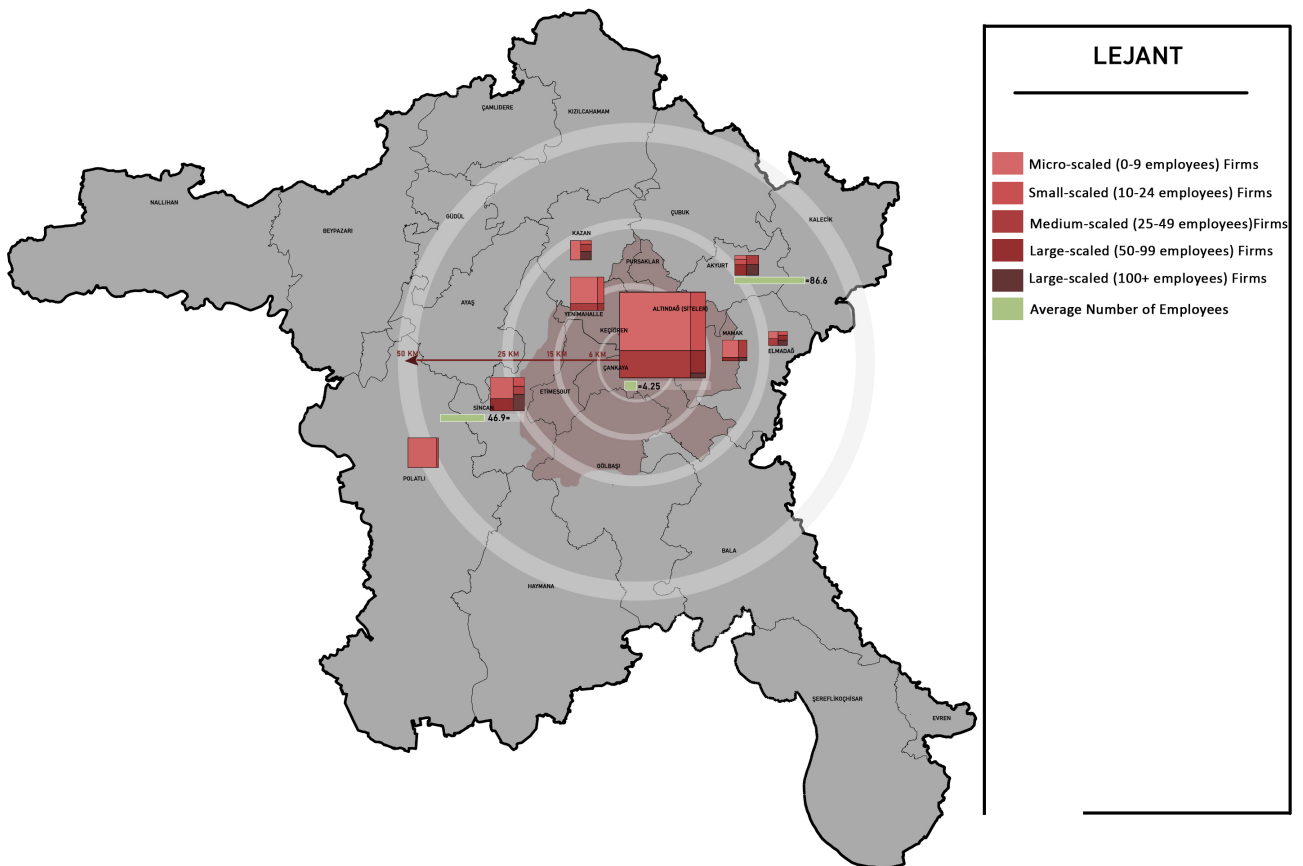
METHODOLOGY

This study examined the changes in the spatial demands of new technologies by transforming the labour force and firm structures, production organisations, and labour processes of firms. The research designed is two-staged. In the first stage, quantitative data from relevant institutions and organisations were obtained in order to reveal the structural characteristics, and general characteristics of the labour force structures of the firms in the furniture industry. The second stage entails a detailed analysis of the firms in the furniture industry where new technology has entered and diffused into. The field study was carried out in Siteler, Akyurt, and Sincan, which are the agglomeration areas of the firms renewing their technology in Ankara Furniture Industry. In a bid to provide comparisons, research questionnaires and/or interviews were also administered to non-technological firms in Siteler – a traditional production area where these firms are concentrated.

Siteler, one of the selected agglomeration areas, is among the most important furniture industry regions of Türkiye. In Siteler, firms are distributed in three neighbourhoods, 80% of which are located in Önder Neighbourhood, while the other firms are located in neighbouring Ulubey and Güneşevler Neighbourhoods (**Figure 2**). Sincan and Akyurt, where furniture firms are widely located, are the administrative districts of Ankara.

Figure 2. Spatial distribution of firms and average number of employees (prepared by authors)

For the field study carried out in Siteler, Akyurt and Sincan, a database for the research subject was created from data at different levels and



qualifications from various institutions. Firstly, industry-wide evaluations were conducted on the Ankara Furniture Industry using data from the Provincial Directorate of Science, Industry and Technology for the year 2015. This data included information on the number of firms, the number of employees categorized by their qualifications (masters, foremen, apprentices, workers, etc.), and the addresses of the firms. This information was evaluated to reveal the labour force, firm demand and labour market characteristics, and spatial distribution of the industry. The data set reveals that within Ankara Furniture Industry, which is dominant by a small firm structure (with an average firm size of 8.23), 87% of the total 1726 firms are categorized as micro-scale, while 7% are classified as small-scale firms (Table 1).

In recent years, new furniture production sub-regions have developed in the Ankara Metropolitan Area with their restructuring process ongoing. However, as of 2015, 80% of the total firms and 41.5% of the employees are located in Sıtel. Apart from Sıtel, Akyurt accounts for 1% of the total firms and 15% of the employees. Akyurt is primarily occupied by large-scale firms using new technology. Similarly, Sincan accommodates 3% of the firms and 17% of the employees, with a concentration of large firms. The remaining 13% of the furniture firms and 25% of the employees in Ankara are dispersed across other districts (Table 2).

Since firms and employees are predominantly located in the Ankara Metropolitan Area, the field study was conducted in three specific locations: Sıtel, known as the traditional production location area, and Akyurt and Sincan, which are both the new agglomeration areas where technology renewal firms are concentrated. At the beginning of the field study, interviews were conducted on: (1) the stages of the production process within the industry, and (2) the traditional and new technologies used (Table 3). The information obtained guided the formulation of the interview style that was conducted on the firms. In line with this, interviews were conducted on key industry players including Ankara Chamber of Furniture and Lacquer Makers, Chamber of Carpenters, Tradesmen, and Craftsmen, as well as prominent firms such as Lazzoni,

Table 1. Spatial distribution of furniture firms in Ankara (Provincial Directorate of Science, Industry and Technology, 2015)

Districts	Total	%	Micro-scaled Firms (1-9 employees)	%	Small-scaled Firms (10-24 employees)	%	Medium-scaled Firms (25-49 employees)	%	Large-scaled Firms (50-99 employees)	%	Large-scaled Firms (100+ employees)	%
Sıtel	1381	80	1251	84	92	80	30	48	7	21	1	5
Altındağ	55	3	51	3	3	2	0	0	1	3	0	0
Yenimahalle	53	3	40	3	7	6	5	8	1	3	0	0
Sincan	50	3	28	2	4	4	3	5	8	24	7	33
Polatlı	47	3	46	3	1	1	0	0	0	0	0	0
Mamak	33	2	23	1	0	0	7	11	3	9	1	5
Akyurt	25	1	3	0	2	2	7	11	6	18	6	29
Kazan	21	1	11	1	2	2	4	7	4	12	0	0
Elmadağ	16	1	4	0	3	2	4	7	2	6	3	14
Others	45	3	38	3	1	1	2	3	1	3	3	14
Total	1726	100	1495	100	115	100	62	100	33	100	21	100

Districts		Number of Firms	Total Number of Firms	%	Number of Employees	Total Number of Employees	%
Akyurt	Akyurt	15	25	1	686	2165	15
	Çankırı Boulevard	9			1360		
	Esenboğa Axis	1			119		
Altındağ	Altındağ	55	1436	83	195	6096	43
	Siteler	1381			5901		
	Industrial Site	3			7		
	Lalahan	2			65		
Sincan	OIZ/Industrial Site	20	50	3	2088	2345	17
	Sincan	28			100		
	Ayaş Axis	2			157		
Other		215	215	13	3598	3598	25
Sum Total		1726	1726	100	14204	14204	100

Table 2. Number of firms and employees in Ankara furniture industry by districts (Provincial Directorate of Science, Industry and Technology, 2015)

Ersa, Kelebek, NURUS, DOĞTAŞ, and Tepe Home. This involved a total of 25 firms in the study.

Firms that have changed their technology at every stage of production were identified in the second stage of the field research in line with the information obtained from the interviews. Then, in-depth interviews were conducted with firms in the identified agglomeration areas to gather detailed information about the use of new technologies, as well as the effects the technologies has had on firms, employees, and space. The structural and spatial effects of new technologies on the firms are considered to be clearly revealed in a comparative manner by including the firms that do not renew their technology in the research. In order to explore the effects of new technologies in Ankara Furniture Industry, qualitative research methods were preferred, specifically using non-probability purposive sampling method. In-depth interviews were conducted with the selected firms. During the interviews, various aspects of the firms were explored, including general firm information, production details, technological infrastructure, the impact of technology changes on the firm, spatial characteristics relocation processes, and factors related to competition. .

An important and primary criterion in the selection of the firms for the interview was to ascertain whether or not they had adopted the new technologies. In order to present a holistic picture within the scope of the study, firms were identified by snowballing method to represent all differences, richness, and diversity. The field study was conducted in June and August 2018. In-depth interviews were conducted on a total of 120 firms: 80 of these firms had renewed their technology (45 in Siteler, 20 in

Table 3. Machines used in the furniture industry before and after the new technology (data obtained from interviews with professional chambers and firms in 2018)

Pre-Production (R&D, design, planning)		Production (Scaling, Cutting, Skeleton, Furnishing, Coating, Banding, Dyeing)		Post-Production (Assembly and Packaging)	
Before new tech	After new tech	Before new tech	After new tech	Before new tech	After new tech
Masters preparing the prototype with elbow grease	Licensed drawing software	-Circular saws with scribe -Planers -Routers -Sandpaper -Spindles -Horizontal Circles -Thicknesses	-CNC Scaling Machine -CNC Punching Machine -Computer Aided Edge Banding -Dyeing and Drying Machines (Robots)	-Manual assembly and packaging	-Computer Aided Packaging and Stretching Machines -Robots

Akyurt and 15 in Sincan), and 40 firms in Sitaler that had not renew their technology.

To obtain quantitative data on the firms, and labour force, as well as qualitative data on the structural and spatial dynamics of restructuring, a semi-structured interview form was used. In addition to standard questions, open ended questions were posed during the interview (each interview lasted approximately an hour and personal observations were made where necessary in the course of the field work. The data obtained at the end of the research were subjected to content analysis, as such, similar and related data were combined and interpreted within the framework of certain concepts and themes (Yıldırım and Şimşek, 2018, 242).

SPATIAL RESTRUCTURING BASED ON THE NEW TECHNOLOGIES IN ANKARA FURNITURE INDUSTRY

This chapter discusses the site selection, spatial development process of the industry in Ankara, and findings from the field study. The furniture sector –which started to develop with the establishment of Sitaler in Ankara in 1959– came to the fore in the 1980s, and started to restructure with the intense use of new technologies since the mid-2000s. Due to this, the spatial distribution of firms have been reshaped with the transformation of production organizations, labour processes, and labour market relations. However, as time went by, the negative externalities experienced in Sitaler reduced the competitiveness of the furniture industry. Simultaneously, spatial arrangement by the 1990 Master Plan Decisions of the local/central government to decentralize the city commenced in earnest. This resulted in the creation of industrial areas in Sincan and Akyurt. Today, both Sincan and Akyurt have emerged as attractive and concentrated locations for medium to large-scale furniture companies that have undergone technological changes. Consequently, decentralization and agglomeration have been the most fundamental features of the spatial processes.

Location Selection and Spatial Development Process of the Furniture Industry in Ankara

The 1950s witness the emergence and widespread of co-operative in small industrial sites such as Yeni, Büyük, Ata, Demir etc. This trend led to the establishment of Sitaler in 1959 by the Keresteciler Co-operative along Samsun road. After the addition of furniture manufacturers in 1969 and marble manufacturers in 1978, Sitaler gradually transformed into an important furniture production hub over the years (ABB, 2007). During this time, the development of industries that support furniture production (for example, construction, wholesale and retail trade) in Ankara also contributed to the specialisation of Sitaler as a furniture production area. Additionally, the demand for public industry in Ankara together with its locational centrality and climate, paved the way for the development of the furniture industry in Ankara. Apparently, this was because Ankara is the capital of Türkiye. There on, with furniture production in Sitaler from early 1980s, Ankara consolidated its position as a furniture manufacturing hub (Beyhan, 2006).

Until recent years, Sitaler not only served as a production hub, it also doubled as an incubation centre where skilled labour force are honed and spread across Türkiye (Beyhan, 2006). Quoting one business owner on his thoughts about Sitaler, he said; “Sitaler’s mentees are all over Türkiye, which is why no matter how big a factory is, you will always find ex-

mentees from Siteler. Therefore, the workshops in Siteler ought to be protected." Another business owner is quoted as saying "Siteler is not just a location, it is a brand. It is a name. And it is a culture." The perspectives shared by these entrepreneurs show that Siteler is a highly regarded brand across the country, reifying the importance of production workshops in Siteler for ensuring skill agglomeration. Introducing spatial dimension into the fold of Siteler furniture industry, the rapid development of Siteler bred the spread of squatter settlements in Ankara, especially around Siteler. Hence, a strong correlation was observable.

After World War II, there was a significant movement of skilled labour to Siteler from Bolu, which at the time had dense forest areas, and a well-developed forest products industry in Türkiye. The migrant workers in Siteler, which were predominantly from Bolu, created the shantytowns in the immediate surroundings of Siteler. This was followed by the movement of unskilled labour from the provinces surrounding Ankara such as Yozgat, Çorum, Çankırı, Kırıkkale and Kırşehir. After arriving Siteler, the unskilled migrants acquired skills on furniture production (Beyhan, 2006). Until the second half of 1980s, Siteler attracted scattered furniture industries and the necessary labour force to cater for them. In the period following that, attention started to shift to other provinces in the Eastern Anatolia Region. Therefore, industrial sites in the Ankara Metropolitan Area, and industrial areas in Akyurt became attractive for the furniture industry.

In the 1990s, with the intensification of the labour mobility of the furniture industry, the process of decentralization from Siteler to the outer zones and other industrial sites in Ankara started to intensify. In later years, Siteler has served as the starting point for the expansions towards Ostim, İvedik, Sincan Organized Industrial Zone, Pursaklar, Akyurt, and industrial areas in the north-eastern part of the Ankara Metropolitan Area. In all, Siteler houses over 13,000 workshops (furniture, upholstery, painting, skeletons, chairs, joinery, etc.) and many furniture retail stores (Ankara İl Sanayi Durum Raporu, 2020). On a flip side, when negative economies of urbanization emerge in big city clusters like Siteler, being located within the city limits expansion opportunities of the clusters (Öz, 2004). At present, Siteler has remained within residential areas which is in parallel with urban development, thus the restriction to expand.

With the decrease in furniture manufacturing in Siteler and the transformation of production units into sales units, problems cutting across urban transportation, environment, and energy have increasingly materialized. Above all, production firms in Siteler clustered together in the city centre face developmental constraints from reaching their natural limits. As such, they cannot be modernize with new technologies that require expansive production areas (Ankara Development Agency, 2012). Faced with such difficulties, the firms restrict retailing to their current locations, and move production that requires more space to areas around Akyurt or other industrial zones within the Ankara Metropolitan Area (Sincan 1st OIZ).

Sincan is the second area where the furniture industry in Ankara is agglomerated. As observed, both medium and large-scale furniture firms have chosen to locate in Sincan 1st OIZ. Sincan 1st OIZ was realized with the 1990 Ankara master plan decision. In 1975, an area of 425 hectares in Sincan Osmaniye was expropriated in line with the 1990 master plan projections, and transferred to Ankara Chamber of Industry in 1982. The industrial area was proposed for a location accessible by highway and

railroad, akin to the development strategy on the western axis of the city in the Master Plan. In addition, 177 hectares of development area was added to the existing industrial area in 1996. In Sincan 1st OIZ, there are firms operating in the furniture industry, and firms belonging to many sub-sectors (ABB, 2007). Totalling around 281, the firms range in size between 5000-100,000m².

Akyurt district, which houses the third industrial production zone where the field study was conducted, is located in the northeast of Ankara. Siteler's proximity to Akyurt industrial corridor has supported the leapfrog development of the furniture industry towards the north-eastern axis of the Ankara Metropolitan Area. The 1990 Ankara Master Plan visualised the area to be an industrial and warehousing area. Staying the course, industrial development intensified in the metropolitan area boundaries around Esenboğa and Akyurt. In this region where 15,000 people were employed on an area of approximately 400 hectares (ABB, 2007), the incentives for investments after 1980 aided the uncontrolled and rapid development of industry in Pursaklar, Saray-Altınova municipalities, and around Akyurt. These include the incentive attraction for being located outside the Metropolitan Municipality boundary (ABB, 2017), and the cooperative attitudes of the municipalities of the towns at that time. The location of Esenboğa Airport also encouraged industrial establishments like technology-intensive industries, logistics activities, and more recently, large industrial furniture industries, to choose a location in Akyurt (ABB, 2007).

Two main trends are observed in the spatial formations in Ankara Furniture Industry. Firstly, relocation (moving away from the centre) and secondly, agglomeration /clustering. Bianchi and Mariotti (2003) and Kronenberg (2013) defined relocation as the migration of firms to another place where they can meet their needs more easily in the process of spatial adaptation that is designed to create desirable situations in the future. With the impact of new technologies, these trends have been widely experienced in Ankara Furniture Industry since the mid-2000s. When the spatial distribution of Ankara Furniture Firms was evaluated as of 2015, 85% of the firms and 45% of the employees were located within the first 6km from the city centre to the periphery. Although the number of firms decreases towards the periphery due to the location of large firms in the periphery, the number of employees and average workplace size increased due to the new agglomeration areas (Akyurt, Sincan) at 25km and 50km distances.

Furthermore, Siteler, which is the traditional agglomeration area within the first 6km still contribute other important externalities through supply, service, customer, and production relations. As an incubation centre for newly established furniture firms, Siteler has the highest number of young firms (firms less than 5 years old) in the industry (**Table 4**).

The analysis of employee spatial distribution based on qualifications uncovered two distinct trends: (i) Traditional labour force, including craftsmen, apprentices, journeymen, and other workers, predominantly found in small firms, tended to locate within the first 6km radius, extending up to a maximum of 25-50km radius. (ii) Qualified labour force, consisting of engineers and technicians responsible for using the new technologies were concentrated in the outer peripheries where large firms are located (**Table 5**).

Distance	Number of firms	%	Total Number of Employees	%	Average Workplace Size	Average Firm Age	Percentage of firms younger than 5 years (%)
6km	1464	85	6432	45	4,39	30,75	80.5
15km	71	4	1287	9	18,13	32,34	3.2
25km	77	4	1679	12	21,81	23,51	4.8
50km	60	3	4722	33	78,7	17,75	11.5
50+Km	54	3	84	1	1,56	19,52	-
TOTAL	1726	100	14204	100	8,23	29,69	100

Table 4. Spatial distribution characteristics of Ankara furniture industry (2015) (Provincial Directorate of Science, Industry and Technology (2015))

	Total No. of Employees	%	No. of white collars	%	No. of Engineers	%	Other Technicians	%	No of Technicians	%	No. of masters	%	No. of Blue collar	%	No. of apprentices	%	No. of foremen	%
0-6km	6432	45	885	50	41	21	36	26	34	14	1221	57	3304	42	63	50	132	43
6-15km	1287	9	104	6	12	6	17	12	86	35	232	11	690	9	18	14	14	5
15-25km	1679	12	201	11	45	23	29	21	37	15	200	9	936	12	16	13	80	26
25-50km	4722	33	537	30	96	49	58	41	90	36	478	22	2995	38	29	23	84	27
TOTAL	14204	100	1767	100	194	100	140	100	247	100	2145	100	7945	100	126	100	310	100

Table 5. Spatial distribution of workers in Ankara furniture industry by qualifications (Provincial Directorate of Science, Industry and Technology (2015))

Findings from the Field Research

Technological Restructuring Process in the Industry and Dynamics of the Restructuring Process

Even though the use of new technologies in Ankara Furniture Industry started in the 1990s, interviews conducted on firm owners/managers revealed that it was not until the mid-2000s that the use penetrated nearly all production stages (**Table 6**). Technological innovations in the industry started with the use of CNC, followed by the integration of robots. Their deployments were in the production and post-production stages, in an effort to adapt to accelerated production process. Acquisitions of the new technological machineries by the firms (75%) were mostly through dealers in machineries and other production paraphernalia. They established these trading relationships mainly in foreign trade fairs and exhibitions (**Table 7**). Additionally, the study revealed that firms acquire technology through their own R&D activities 61% of the time, and 59% the time, through domestic and foreign partners. Generally, during acquisitions, large companies in the sector work alongside TUSAŞ (Turkish Aerospace Industries), TÜBİTAK (Scientific and Technological Research Council of Türkiye) and TSE (Turkish Standards Institution). Together with the CNC and robotic technologies widely used in the industry, large companies also consider “new process” as a part of technological innovations, which they mostly access in R&D centres.

New Technologies	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015	Total	Germany	Italy	Ankara	İstanbul
CNC	0	1	18	51	9	79	18	15	45	1
Robotics	0	0	0	6	45	51	22	20	9	0
Computer Aided Planning	1	5	3	2	2	13	1	1	5	6
Automated Assembly	0	0	1	2	15	18	4	8	4	1
Total	1	6	22	61	71	161	45	44	63	8

Table 6. Years of Acquisition of New Technologies and Place of New Technology Purchase by Firms (Data Obtained in 2018 from Firm Interviews)

Places Where New Technologies are Sourced	Number	%
Firm’s own R&D activities	49	61
University Cooperation	3	4
Transfers	8	10
Domestic and international partners	47	59
Machinery and equipment dealers	60	75
Purchases of trademarks, patents, licenses, etc.	14	18

Table 7. Ways to Acquire New Technologies (Data Obtained in 2018 from Firm Interviews)

Firms mainly procure CNC machines from dealers in Ankara, while robots, and mass assembly equipment are purchased from Germany and Italy (Table 6). In general, the new machines are purchased as first-hand. This suggests that the use of second-hand machines are limited. Firms that have renewed their technologies have facilitated the adaptation process of their employees to recent technological changes through training supports. In addition to local trainings providers such as Beltek, İki Teknik, Ankara Tasarım, and others, firms also collaborate with suppliers of machineries and other paraphernalia to receive on-site training for their employees on the operation of the new technologies. For example, employees from 18% and 5% of the firms interviewed have received on-site trainings from Italian and German firms respectively. Also revealed in the study is that the technological changes have impacted cost, quality, and efficiency of production in the industry. It has enabled the production of high value-added products (Table 8).

Socio-economic and institutional factors such as firms’ size, structure of firms, demand structure and workforce structure have impacted the emergence of technological changes in the Ankara Furniture Industry. Among these are seasonal changes in demand structure of the industry, and demand-driven production. Furthermore, the structure of small firms within the industry has been strengthened as they extensively engage in subcontracting to access specialised services for various stages of the production process. The average firm size in Ankara Furniture Industry

Table 8. Novelties experienced with technological developments (data obtained in 2018 from firm interviews)

Changes in Production	Min	Max.	Average	Standard Deviation
Added Value of Products Increased	4	5	4,82	0,357
Scrap and Waste Rates Decreased	4	5	4,62	0,363
Unit Cost Reduced	4	4	4,62	0,472
Quality of Products Improved	2	5	4,43	0,609
Yield Increased	1	5	4,30	0,716
Production Automated	1	4	4,10	0,844
Delivery Speed Increased	1	4	4,10	1,112
Products Diversified	1	3	4,02	1,253

is 8.23. The fact that the industry is largely composed of micro and small firms makes it difficult to adopt and spread new technologies throughout the industry. This is in line with Erdoğanaras's (2002) study on the İstanbul Printing and Publishing Industry and Kepenek's (2018) study on the Ankara Furniture Industry in Siteler. The two studies emphasized that small firms are more limited in capacity to invest and adopt new technologies when compared with large firms. To show this, Kepenek (2018) reported that approximately 62% of small and medium-sized firms in Siteler had not effected any changes in their technology.

The demand structure of the industry is another factor affecting technology renewal. According to this study, 70-80% of production in the industry takes place between April and September. The furniture industry experiences intensity in production within this period of six months. However, some firms noted that the seasonality of furniture has gradually decreased in recent years due to the popularization, and mainstreaming of new furniture types. Quoting a firm owner; "in the past, customers only change their furniture few times throughout their lives. Now, they change it every two to three years and if they cannot afford to change it completely, they change the fabrics or colours of their furniture."

Another factor affecting technology change in the industry is shortage of skilled labour. This is because new technologies require firms to employ labour with the technical know-how. However, workers in Ankara Furniture Industry are mostly trained through apprenticeship system, and have no prior technical knowledge. A study in 2015 showed that 59% of the employees in Ankara Furniture Industry were unskilled manual labourers, with the percentage for engineers and technical personnel standing at 1.37% and 2.72% respectively (Ministry of Science, Industry and Technology, 2015). Alas, increase in quality and productivity requires well-trained technical personnel.

Summarily, the use and adoption of new technologies in the Ankara Furniture Industry are hindered by various factors such as small firm sizes, family business ownership, limited capital opportunities, shortage of skilled labour, and inadequacy of technical education in schools. These constraints significantly affects the spatial distribution and operation dynamics of the Industry.

Effects of New Technologies on Production Organizations, Labour Processes and Labour Market

The introduction of new technologies into Ankara Furniture Industry has transformed production organizations, labour processes, and labour market relations. Also, it has reshaped the spatial demands and distribution of firms. In this section, these changes were discussed.

During the restructuring period in the industry, radical changes were observed in the organization of production when the most rational combination of labour and capital were applied. Notable results for the firms that renewed their technologies were 58% vertical integration, and 94% growth in size. Increased production capacities and large space requirement impacted the change. Contrary to the Post-Fordist restructuring period, when some production processes in developed countries were moved to external firms to increase flexibility, the Ankara furniture industries' restructuring period led to decreased outsourcing. This was majorly due to increase in capacity and the quest to maintain product quality. Putting it in figures, while 70% of the firms that did

not renew their technology outsourced aspects of productions, this rate decreased to 42% in firms that renewed their technology.

The study observed that non-technology-refurbished firms that specialized mainly in only one stage in the production process subcontracted more: the nature of their business together with the need to complete the production process made outsourcing a must. In contrast, firms that upgraded their technology to increase their market share, and incorporate new designs carried out contract manufacturing for foreign firms leaving out their own brands. In addition, the rate of innovation per firm increased by 0.28 for firms that did not renew their technology, and 0.53 for firms that did. It is worthy of mention that technology renewal strengthens the innovation potentials of firms. Moreover, product innovation is most common in the industry where copying is very high. While the rate of product innovation increased to 86% in firms that renewed their technology, it remained at around 45% for firms that did not renew their technology (Table 9).

The use of new technology also reshapes labour processes thereby leading to significant changes in the quality, and quantity of employees in the industry. The most radical changes in the production process (pre-production, production, and post-production stages) have occurred in the pre-production stage. The pre-production stage that was previously part of the production process has experienced new technological developments. As a result, this stage now requires high technical skills to use the new technologies.

In an interview, a firm owner also said that “customers now make their decisions by seeing a computerised version of their preferences.” In R&D-design and planning department, education and technology-based skills have gained importance, consequently leading to increase in the education levels and wages of employees, and office-type jobs (see Table 10). For context, R&D-design and planning department is where intended product are described, and the designs made with Computer Aided Programming before their transfer to CNC machines for the products to take final shape. Reflecting on this, the proportion of college/university graduates in firms where technology were upgraded rose to 14%, while the rate remained at 3% for firms yet to upgraded their technology. Beyhan’s study of Siteler supports this finding as it showed that only 6.31% of the employees were university/college graduates, and that the workers’ educational level was predominantly below university/college level (Beyhan 2006).

The Skills-Driven Technological Change Approach emphasizes that technological innovations complements highly skilled workforce and that their wages increase due to increasing productivity (Weiss and Garloff, 2005). Also, technological development reduces the impact of the need for labour and enable women take part in production mechanism a lot easier (Autor et al., 2003; Gibbs, 2017). 75% of firms in the industry that

Table 9. Number of Innovations in the last 5 years (data obtained in 2018 from firm interviews)

	Firms Renewing Technology			Firms Not Renewing Technology		
	Total	%	Innovation per Firm	Total	%	Innovation per Firm
Product Innovation	36	86	0,45	5	45	0,13
Process Innovation	5	12	0,06	0	0	0
Organizational Innovation	0	0	0	2	18	0,05
Marketing Innovation	1	2	0,01	4	36	0,10
Total	42	100	0,53	11	100	0,28

Level of Education	Siteler	%	Akyurt	%	Sincan	%	Firms Renewing Technology	%	Firms Not Renewing Technology	%
Primary School	21	25	17	14	37	23	23	21	31	33
Secondary School	19	23	34	28	44	28	28	26	28	30
High School	17	20	33	27	32	20	25	23	24	26
Vocational High School	15	18	18	15	27	17	18	17	8	9
University or Higher	12	14	20	16	19	12	15	14	3	3
Total	84	100	122	100	159	100	109	100	94	100

Table 10. Educational status of employees in ankara furniture industry (data obtained in 2018 from firm interviews)

failed to innovate technologically stated that women did not work, yet, the rate decreased to 11% for firms that innovated technologically. Other observations were that increase in office-type jobs with new technologies has prepared an easier and better work environment for women. Therefore, it has made women that work upholstery jobs, where manual skills are only sought, gain access into production process with possession of higher education. In other words, women's labour is no longer the unskilled labour force used in traditional industries but a skilled labour force that uses information technologies (**Table 11**).

The impact of new technologies also affects labour markets, and the shortage of skilled labour is underlined as one of the main problems developing countries face as a result of their adoption. The lack of investment in the quality of labour in these countries creates a need for skilled labour that uses new technologies. In Ankara Furniture Industry, 59% of the labour force are unskilled, and 68% of firms face difficulties in finding qualified labour.

Similarly, since the mid-1980s, there has been a gradual decline and aging of the qualified young labour force in Siteler (Beyhan, 2006). Affiliates of firms stated that before compulsory education was introduced in the 90s, they used to work with craftsmen who were trained through apprenticeship. However, as vocational high schools have lost prestige in the education system recently, everyone is focused on university education. In fact, students attending vocational high schools have shifted to departments such as computer science etc. over time, instead of dusty-grimy furniture education. In Siteler, the population of craftsmen has significantly dwindled, and currently, their numbers are limited, with the youngest among them being in their 40s. If the current trend continues, there might not be any craftsmen available to do the job in the next 15-20 years because new craftsmen are not being trained. This is leading to shortage of personnel in the furniture industry today. Collectively, the trends threatens the future of the Siteler Furniture Cluster. The trend

Table 11. Departments of the female labour force in Ankara furniture industry (data obtained in 2018 from firm interviews)

Department of Employment	Siteler	Akyurt	Sincan	Firms Renewing Technology		Firms Not Renewing Technology	
				Number	%	Number	%
Dining	10	0	2	12	15	4	10
Furnishing	18	1	4	23	29	1	3
Sales	8	7	4	19	24	5	13
Engineering	1	7	3	11	14	-	0
Administrative	0	5	1	6	8	-	0
No Female Employees	8	0	1	9	11	30	75
Total	45	20	15	80	100	40	100

started in the early 1980s with the exclusion of the young labour force from the labour market. One of the main factors that brought about this situation was the legal reforms in national education policy in 1997.

The new education law expanded the scope of compulsory education to encompass secondary education in addition to the previously mandatory primary school education. The change has since been negatively affecting apprenticeship training. As a result, the labour capacity in Siteler has decreased significantly in recent years. For the first time in its history, the Siteler Furniture Cluster has become dependent on external labour mobility (Beyhan, 2006). Unfortunately, the defectiveness of educational curriculum to match new technologies has prevented the problem from being overcome. The President of the Ankara Chamber of Furniture Manufacturers (ANKAMOB) stated that students in vocational high schools should be trained on new technological machines, stating further that there are problems in the industry in that sense. Therefore, there is a need to enhance the desirability of vocational high schools through the improvements of the education system. According to one firm owner; 'qualified personnel are extremely important to achieve high value-added furniture productions. In the past, individuals that went through the master-apprentice hierarchy to become masters were the most important people in the business. Nowadays, it has become extremely difficult to find employees in the training process who have achieved or are a level away from attaining mastery. Consequently, the importance of vocational high schools to the industry cannot be overemphasized, thus, vocational schools need to be supported on a very large scale'.

The prevalence of small and medium-sized firm structure in Ankara Furniture Industry has led to a prevalence of family businesses. This has made informal employment to increase, thereby jettisoning increasing labour costs from limited institutionalization and financial constraints. Today, Syrian refugees are concentrated in areas with worse working conditions in the industry (for example, paint shops, machining, and dusty cutting workshops, etc.), and in jobs only needing manual skills like carving. Generally, such areas are avoided by Turks. Momentum in the industry has amplified in recent years especially since Syrians became mostly preferred for jobs due to their high level of manual skills together with their willingness to accept low wages out of desperation (Savran, 2020). The statements "immigrants have a serious employment potential in the furniture industry," and "10 years from now, when the services of a master is needed, a Syrian master will be called," by a corporate industry representative, and another firm owner, respectively, show the substantial role that immigrants have gained in the industry's production.

Spatial Effects of the New Technologies in Ankara Furniture Industry

An export-oriented production model has been adopted in Türkiye, to the effect that it has increased the demand for production abroad. Consequently, workshop-type production units in the furniture industry are emerging and taking roots within the city of Ankara. Not only that, they are going through a process of transformation into larger and more efficient firms. This transformation process is not without its challenges. Öz (2004) for example, argued that negative externalities such as congestion costs, inability to expand, and rising land prices in the furniture industry, reduces the competitiveness of the Siteler furniture cluster, and leads to its economic decline. To this effect, new spatial arrangements were made with the planning decisions of the local/central government to

decentralize the city. The industrial areas created in Sincan, and Akyurt with the 1990 Master Plan decisions are notable examples. As observed, the Ankara Furniture Industry has undergone a significant and intensive restructuring process since the mid-2000s. As a result, new agglomeration areas have emerged in Sincan and Akyurt, complementing Siteler that is the traditional production location. Locations of the industrial areas were informed by cheap land, industrial infrastructure, tax reductions, and financial subsidies. Medium, and especially large-scale furniture firms that have changed their technology and are mainly export-oriented, are concentrated in these areas.

The pandemic in recent years has also contributed to this restructuring process relying on new technologies. Here is how: since the breakdown of the Far East supply chains due to the pandemic, there have been new demands from the USA and Europe. To meet these demands, horizontal factory areas capable of producing large amounts of furniture in a short time are needed; as opposed to vertical production workshops. To corroborate this logic, a business owner recounted that “today, our guests come from America, and want one container of a model a week.” The business owner continued, noting that, “if all Siteler worked for us in these buildings, we still would not meet this demand, we need to switch to horizontal production factories as soon as possible.” In essence, in the Ankara Furniture Industry, new technologies have brought about two spatial tendencies: Relocation Processes and Agglomeration/Clustering.

Relocation processes

When the new spatial locations of the firms that upgraded their technology were evaluated, results showed that 75% of the firms (60 firms) chose central locations within the city, 14% (11 firms) chose locations in the periphery and 11% (9 firms) chose locations outside the city (**Table 12**). Siteler mainly produces for the Ankara Metropolitan Area (**Table 13**). It is centrally located, and has a large number of small firms with close input-output relations. These firms are organized horizontally, with firms specializing in single branches of production such as turners, upholsterers, skeletonists, polishers, lacquers-painters, and coaters coming together. At the same time, the existence of widespread subcontracting relationships supports the tendency to coexist in Siteler. On a different note, medium-sized firms that renew their technology and specialize in a single production stage are still predominantly located in central locations (in Siteler). Another observation from the study was that firms, whose subcontracting relations decrease with new technologies, vertically integrate in their production processes, and thus grew larger, diversified their markets, and expanded abroad. These firms are now relocating to the city periphery (such as Sincan), and outside the existing urban spot (such as Akyurt). A summation can thus be made that the housing market characteristics of Sincan and Akyurt, where low-income housing areas are located, provide an advantage in accessing the unskilled labour needed.

The interviews with 80 firms that upgraded their technology in this industry in 2018 showed that, except for mobility within the same district, mostly, large firms moved from Siteler to Sincan and Akyurt districts. In a sense, it was gathered that 100% of the firms that renewed their technology changed their location, and the average mobility per firm was 1.3. Furthermore, it was observed that a total of 103 relocations occurred by 80 technology upgrading firms. When the years in which these relocations occurred were analysed, findings were that 47% of the

Table 12. Distribution of relocated firms according to their new spatial locations (data obtained from the firm interviews conducted in 2018)

Location of the relocating firms	Firms Renewing Technology		Firms Not Renewing Technology	
	Number	%	Number	%
Inner-City	60	75	40	100
Periphery	11	14	-	-
Outer-City	9	11	-	-
Total	80	100	40	100

Firm Size	Firms Renewing Technology					Firms Not Renewing Technology				
	Ankara	İstanbul	Domestic	Foreign	Total	Ankara	İstanbul	Domestic	Foreign	Total
1-9	65	10	25	-	100	85	15	-	-	100
10-24	40	25	35	-	100	65	35	-	-	100
25-49	30	30	35	5	100	60	40	-	-	100
50-99	35	15	25	25	100	-	-	-	-	100
100+	25	20	35	20	100	-	-	-	-	100

Table 13. Market shares of firms in Ankara furniture industry by size (%) (data obtained from the firm interviews conducted in 2018)

relocations happened between 1990 and 2018 – when new technologies started to enter the industry and 24% of the relocations took place after 2000 – when intense technological changes took place (Table 14). In other words, relocations in the industry are realized individually rather than by acting together.

In the relocation processes in the Ankara Furniture Industry, changes in firm structures with new technologies make it difficult for firms to locate in the centre, and the current locations prevent firms from physically expanding (Table 15). In addition to the sites reaching their natural limits and having no potential for development, the fact that the land on which the sites were located is now worth more than the land in suburban locations (Ankara Development Agency, 2012) makes it difficult to switch to new technologies due to space constraints and high financing costs. Thus, making cheaper and larger industrial areas on the periphery and outside the city becomes attractive. Accordingly, when the average cost of industrial lands in Sıtele, Sincan, and Akyurt are compared over the Kent95 data, the land costs in Sincan were lower (by more than 50%), and in Akyurt, the costs were reduced to almost a tenth. Average land prices in these neighborhoods are as following: Sıtele (Ulubey, Önder) is 579,5TL/ M²; Sıtele (Güneşevler) is 710,3TL/M²; Sincan 1st Organized Industrial Zone (Ahi-Evran Neighborhoods) is 232,0TL/M²; Akyurt (Büğdüz-Çankırı Street) is 59,0TL/ M² (Source: Kent95 2021 Data).

These land costs provide an advantage for firms that will locate horizontally with new technologies. A firm owner who is considering to relocate from Sıtele stated that “the place to be relocated should be within easy access of the suppliers, and within easy access of the employees. It should be at a maximum distance of 15-20 km from Sıtele”. Moreover,

Table 14. Number of relocation of technology renewing firms by periods (data obtained from the firm interviews conducted in 2018)

Period of Relocation	Number of Firms Renewing Technology	%
Before 1980	42	41
1981-1990	12	12
1991-2000	24	23
2001-2010	21	20
2011-2018	4	4
Total	103	100

Factors	Siteler	Sincan	Akyurt	Firms Renewing Technology	Firms Not Renewing Technology
High Financing Costs	13	27	10	15	35
Velocity of Change of Technology	4	20	25	13	0
Unconsciousness in Technology Selection	0	0	10	3	0
Insufficiency of Expert Staff	18	0	15	14	10
Lack of Compatible Technology with Suppliers	4	7	0	4	0
Technical Support and Service Problem	7	0	10	6	8
National Infrastructure Cost	4	13	0	5	0
Inadequacy of R&D Activities	4	7	15	8	0
Lack of Market Research	0	0	5	1	0
Failure to Benefit from Loans	4	0	10	5	0
Shortage of space	24	20	0	18	48
Expensive Service and Maintenance	7	7	0	5	0
No Barriers	9	0	0	5	0
Total	100	100	100	100	100

Table 15. Factors affecting the transition to new technology (%) (data obtained from the firm interviews conducted in 2018)

the success stories of the relocated firms also point to the positive effects of moving from Siteler to another region and overcoming geographical problems. Similarly, the spatial relocation behaviour of the manufacturing industry in Ankara between 1988 and 2007 is mainly influenced by spatial problems caused by growth (Bostan et al., 2010).

Changes in some qualitative and quantitative characteristics of firms in the Ankara Furniture Industry have been observed along with the decentralization process. It was observed that the number of employees and the number of machines of the firms increased, and their outdoor and indoor spaces expanded (**Table 16; Figures 3-6**). The logic is that the production spaces of firms are mostly located on the ground floor, where they locate their machineries and equipment. In the event that the size of machinery and equipment increases, it inevitably increases the requirements for indoor spaces (spaces for loading and unloading for example), which ultimately increases the firm's requirement in terms of outdoor spaces. In fact, due to the large volume of products generated by the industry and the increase in production speed enabled by new technologies, firms express their need for large areas. They emphasized that "if the production of a few days cannot be delivered to the customer, we become unable to work due to lack of space". In addition to these, with the change in technology, production is based more on machine power, and diversification of production that increases competitiveness was observed.

Table 16. Structural and spatial characteristics of firms before and after relocation (data obtained from the firm interviews conducted in 2018)

	Firms Renewing Technology			Firms Not Renewing Technology		
	Second Former location	Former location	Current Location	Second Former location	Former location	Current Location
Avr. Nr of Employees	31	60	304	-	6,5	43
Avr. Outdoor Space (m ²)	250	1500 m ²	2500 m ²	-	-	150 m ²
Avr. Indoor Space(m ²)	4500 m ²	6500 m ²	15000 m ²	-	1250 m ²	1200 m ²
Production Methods	10% machinery 90% manual	30% machinery 70% manual	99% machinery 1% manual	-	5% machinery 95% manual	15% machinery 85% manual



Figures 3-6. Views of large scale furniture factories

Furthermore, the introduction of strategic incentives provided by central and local governments in and around the city is also a determining factor for relocation. It is also evident that the firms that moved to Sincan 1st OIZ and Akyurt, are mostly large-scale and export-oriented firms, hence, they possess the capacity to easily benefit from such government incentives (Table 17). An effective illustration of this is the national brand-building incentive program called “Turquality” implemented by the central government. This program, functioning as an accreditation system, not only aims to elevate the beneficiary companies to international benchmarks but also create awareness of internationally accepted values like quality and novelty that are actually carried by these brands. The program aims to create 10 world brands in 10 years, and its impact has been noteworthy. Some large companies (NURUS, ERSA, etc.) have benefited from these incentives with the inclusion of the furniture sector in the program, which did not include the furniture sector at the beginning. Moreover, the active role of Akyurt’s local government in assigning land to firms based on the decisions of the Metropolitan Development Plan, which aims to be a developed district in the industrial sector outside the existing urban area, has been decisive. At the beginning of the relocation process, furniture firms relocated to Akyurt, based on partial development plans, settling on agricultural lands bought from villagers at significantly cheap prices.

Over time, as the demand for relocation and new space requirements of the firms in Sıtelier intensified around Akyurt, the local governments approved the 1st and 2nd phase industrial plans in 2008 and 2012, respectively, in order to respond to this demand. The smallest parcel in the industrial area with approximately 300 parcels was determined as 3,000 m². Bureaucratic procedures (construction permits, etc.) for industrial firms were completed in a short time such as a week, and the procedures were facilitated. Specifically, the availability of cheaper and larger land, proximity to Sıtelier, and the urban centre characteristic are the major factors in the relocation. Besides them, the proximity of Akyurt to the Esenboğa Airport in terms of logistics, its location on an intercity axis, and Kastamonu and Çankırı axis where wood is obtained, the presence of a furniture fair area, and the incentives of the local government, all play an attractive role. Additionally,

the fact that many of the employees in Sıtelер have their housing areas in Akyurt and its surrounding settlements (Çubuk, Pursaklar) with affordable houses also facilitates access to the work. By the end of 2022, the construction has begun on the arrangement of 50 hectares of public property on Çankırı Street, into 3,000 m² and about 140 parcels, to be transferred to firms relocating from Sıtelер. This indicates that the process of relocation of furniture firms, which has been taking place individually so far, has now shifted to a cooperative process of location change.

In Sincan, the advantages provided by the organized industrial zone, such as proximity to suppliers, the presence of educational institutions, cheaper energy, water, and other expenses, and the excellent IT infrastructure, are attractive to furniture firms. The fact that Sincan 1st OIZ is a brand for growing businesses, and serves as the first point of contact with customers from foreign countries also makes it stand out. Nevertheless, the lack of shared infrastructure in Akyurt has led to difficulties, especially in energy and waste management, causing some large-scale furniture firms (such as NURUS) to move to Sincan 1st OIZ in order to increase their productivity. In recent years, the cent-dependent structure of the Ankara Furniture Industry has started to change, albeit partially (Erdoganaras and Erol, 2016). It can be said that the planned industrial areas also support this process of relocation.

In Ankara Furniture Industry, it was observed that the relocation process within the metropolitan area occurred only within short distances. For context, the average distance of firm mobility in the industry is 17 km. The average relocation distance in the industry is higher than the average distance (13.6 km) of the manufacturing industry firms that relocated between 1988-2007 in the Ankara Metropolitan Area (Bostan, 2008; Bostan et al., 2010). On the other hand, firms that renewed their technology choose locations in the periphery and outside the city due to the need for large

Figure 7. Spatial distribution of furniture firms in Sincan 1st OIZ. Source: Google Earth Pro Images, 2023





Figure 8. Spatial distribution of furniture firms in Akyurt. Source: Google Earth Pro Images, 2023

space, in other words, farther away from the customer, while leaving their branches for display purposes in the centre. Thus, 94% of the firms that renewed their technology, which solved their problems in customer relations within the city, stated that they were satisfied with their new locations.

Firms that did not renew their technology were located in Siteler, close to raw materials and intertwined with subcontracting firms. Also they easy to access, and accessible to customers. However, during the interviews, it was mentioned that small business areas, parking problems, the need to conduct production and display in the same place (with display on ground floor and production on upper floors), lack of elevators causing problems in equipment, machinery, and transportation, as well as other infrastructure challenges, have negative impact on these firms. In particular, firms that do not renew their technology want to be close to firms specialized in single

Table 17. Structural characteristics of firms renewing technology (data obtained from the firm interviews conducted in 2018)

	Siteler		Sincan 1st. OIZ		Akyurt	
	Number of Firms	%	Number of Firms	%	Number of Firms	%
Average Size of Firm		51		131		123
Average Age of Firm		45		15		20
Average Indoor Space(m2)		3.000		10.000		7.500
Average Outdoor Space(m2)		80		3.750		2.250
Average Total Space(m2)		3.080		13.750		9.750
Sizes of Firms	Number of Firms	%	Number of Firms	%	Number of Firms	%
Micro-Scale Firms (1-9)	9	20,0	0	0	0	0
Small Scale Firms (10-24)	11	24,4	0	0	0	0
Medium Scale Firms (25-49)	3	6,8	4	26,7	5	25,0
Large Scale Firms (50-99)	16	35,5	4	26,7	6	30,0
Large Scale Firms (100+)	6	13,3	7	46,6	9	45,0



Figure 9. Siteler industry zone (Google Earth Pro Images; 2023)

line production, which is why they concentrate in Siteler. To quote one of the firm owners - “despite all the negativities, we are located in the heart of the industry” (**Figure 9**). The desire to be close to other specialized firms makes spatial proximity a necessary condition for location choice, and firms in Siteler survive with the externalities of agglomeration economies despite the increasing complexity and congestion caused by spatial agglomeration.

Agglomeration/Clustering

One of the important spatial findings of the study is that the tendency of agglomeration/clustering in the restructuring process has come to the fore in both traditional (Siteler), and new production areas (Akyurt, Sincan). Among the firms using new technology, 77% (79 relocations) of the relocations were to organized areas, and 23% (24 relocations) were to unorganized areas (**Table 18**). This shows that planned industrial areas offer attractive conditions for relocating firms, direct the relocation process, and support the tendency towards agglomeration and clustering. In addition, it was observed that firms that renew their technologies, while moving away from the centre after some structural changes, started to agglomerate on the urban periphery and outside the city, either in organized industrial areas due to the externalities offered, or in new locations without being organized (Akyurt example). Unlike the literature on agglomeration and clustering based on small and medium-sized firms, large-scale independent firms are concentrated in these new agglomeration areas.

Besides, the fact that the majority of relocations in the Ankara Furniture Industry happened within the same district (59.2%) clearly reveals the tendency of agglomeration/clustering (**Table 19**). The largest share is accounted for by relocations within Siteler (40.8%), followed by relocations within Sincan (12.6%) and Akyurt (5.8%). Intense subcontracting relations

Size of Firm	Mobility to an organized zone		Mobility to a non-organized zone		Total Mobility	
	Number	%	Number	%	Number	%
Micro Scale Firms	18	100	0	0	18	100
Small Scale Firms	14	100	0	0	14	100
Medium Scale Firms	22	69	10	31	32	100
Large Scale Firms	14	64	8	36	22	100
Large Scale Firms (with more than 100 employees)	11	65	6	35	17	100
Total	79	77	24	23	103	100

Table 18. Spatial distribution of mobility of relocated firms according to firm size (data obtained from the firm interviews conducted in 2018)

Table 19. Distribution of relocation patterns of firms renewing their technology (data obtained from the firm interviews conducted in 2018)

Relocation Pattern	Number of Relocations	%
Relocation from outside the province	9	8.7
Relocation between Districts	33	32.1
In-district Relocation	61	59.2
Total	103	100

and input-output structure in the industry support staying in the same district, in other words, in the same cluster.

While the firms operating in Ankara mainly relocate to organized areas, the firms operating outside Ankara and abroad mainly relocate to unorganized areas (**Table 20**).

Highlighted in literature is that complementary and competitive relationships between agglomeration areas are common in the industry. In this framework, Siteler appears to maintain its traditional role in its relations with other firms. Siteler is largely self-sufficient as 44% of the relationships (supply, service, customer, and contract manufacturing) established by firms are done within Siteler itself. While Akyurt and Sincan fulfil 13% and 27% of total relations respectively, 24% of firms in Akyurt and 22% of firms in Sincan complete their production relations with Siteler (**Table 21**).

In this context, Siteler plays an important role in the new spatial organization of the industry and supports new production areas in almost all types of relationships. However, although the literature emphasizes the prevalence of complementary and competitive relationships between

Table 20. Active markets of the relocated firms (data obtained from the firm interviews conducted in 2018)

Product Market	Firms relocating to an organized zone (%)	Firms relocating to a non-organized zone (%)	All firms relocating (%)
Ankara Centre	46	38	42
İstanbul	15	15	15
Domestic	23	33	28
Foreign	10	20	15
Total	100	100	100

Table 21. Spatial distribution of relationships between firms renewing technology (%) (data obtained from the firm interviews conducted in 2018)

Districts	Inner-city								Inner-city	%	Foreign	%	Total	%
	Siteler	%	Akyurt	%	Sincan	%	Other	%						
Siteler	225	44	0	0	1	0	102	20	136	27	48	9	512	100
Akyurt	122	24	63	13	0	0	56	12	206	42	45	9	492	100
Sincan	125	22	0	0	154	27	107	18	129	22	65	11	580	100

agglomeration areas in the industry, it was observed that no relationship has been established between the new production agglomeration areas of Akyurt and Sincan. Additionally, the relationships established by Akyurt and Sincan with Siteler are one-way, with limited interaction and reciprocity. This can be partly explained by the requirement for institutional arrangements and time for the development of existing networks in the new agglomeration areas. Furthermore, it can be attributed to the characteristics of firms in these areas, such as their large size, vertically integrated, high export capacity, and low dependency on other firms.

DISCUSSION AND CONCLUSION

The labour-intensive and low-tech furniture industry is, without doubt, going through a rapid restructuring process, which in recent years has been made possible through the opportunities offered by new technologies in making furniture more efficient and advanced, not only in Ankara, but globally. These new technologies, the article argued offers significant opportunities too numerous to mention. But when taken together, these opportunities engender high employment and wage increase in traditional industries like furniture. In this study, [we] sought answers to ‘the kind of spatial behaviours that arises due to new technologies utilized in the Ankara Furniture Industry to transform the production and organization processes.’ In other words, what characteristics embody and animate these spatial behaviours? To do this, the spatial effects of new technologies in the restructuring process in Ankara Furniture Industry were evaluated together with the transformations in firm and labour force structures. Following that evaluation, the begging question was not necessarily that of differences, if any, that existed between firms that have renewed their technology and those that haven’t. That is somewhat obvious, far from it, the question that needed answering was that of the effects the new technologies had in the furniture industry, particularly how these effects could be understood comparatively between firms that have renewed their technology and those that haven’t.

With new technologies in the industry, firms tend to vertically integrate and grow, and outsourcing practices decrease in order to meet capacity increment, whilst overcoming quality bottlenecks. Also, new skills are acquired with the introduction of new technologies in the design and production processes, so much that it increases the demand for office-type jobs for highly educated female labour force who possessed the requisite technical knowledge. From the foregoing, it needs restating that on the one hand, the demand for human capital and capacity increased; which implied that employees were not substituted with technology, and firms did not downsize. On the other hand, the problem of skilled labour shortage persisted due to the lack of adequate technical training opportunities in the industry dominated by unskilled labour.

In this process, striking differences between firm structures within the industry are noteworthy with the use of technology. For context, firms that renew their technology are: export-oriented, innovative, capital-intensive, medium, and more often than not, large-scale firms; while firms that do not renew their technology are mainly domestic market-oriented, labour-intensive, and small-scale firms. These differences in firm structures are also observed in terms of space, that is, the spatial demands and agglomeration areas of firms that renew and did not renew

their technology. In the Ankara Furniture Industry, firms that did not renew their technologies are clustered in Sitaler, which is the current agglomeration area for small labour-intensive firms with high mutual interaction due to the intensive input-output relations between them. At the same time, some medium-sized firms that specialize in a single branch of production have chosen to locate in this area in order to complete the production process with other firms by continuing their traditional production while renewing their technology. At the risk of not rehashing the issues of firms being confined to small spaces, expansion challenges, and rising land prices in Sitaler. It is worthy to note that attractive conditions such as incentives offered by central and local governments, as well as organized industrial zones in suburban and rural areas with appealing planning strategies and low land prices, are the primary factors driving the relocation of furniture firms away from Sitaler. Despite all these, Sitaler still remains an incubation centre for new small firms due to the externalities it provides.

Firms that renew their technology choose to locate outside the existing agglomeration areas with growing firm scales, in newly developing areas with efficient transportation and infrastructure systems, cheap industrial land and easy access to labour force. This agglomeration somewhat contradicts the sentiments in the literature that: 'new technology firms that produce high value-added products and focus on niche markets in developed countries are small-scale firms and cluster in central areas in developed countries.' In the case of Ankara Furniture Industry, unlike the examples of developed countries, large firms that renew their technology tend to cluster in organized industrial zones (Sincan) or in new areas (Akyurt) that develop spontaneously without any organization. This points to a different structure, away from the literature on agglomeration and clustering of small and medium-sized firms. The advantages provided by the organized industrial zone in Sincan, alongside the active role and encouraging attitudes of the local government in Akyurt have been decisive in this agglomeration behaviour of large-scale firms.

Central and local governments (Sincan and Akyurt) encouraged suburban industrial development, and they used proactive planning interventions as an incentive. In terms of market forces, up to recent years, industrial land was low priced in order to attract industrial investment which facilitated furniture industry relocation to Sincan and Akyurt together with the suburbanization of Ankara since 1985. At the same time, firms that upgrade their technology relocate due to the impact of new technologies, and relocation distances differ depending on firm size and vertical integration levels, due to capacity increases in these firms. In this process, medium-sized firms specializing in a single production stage are mainly relocated within the same district (within Sitaler itself) for short distances, while vertically integrated large firms are relocated to long distances towards the periphery, and outside the city.

While the clustering cum agglomeration pattern that increases competitiveness in the Ankara Furniture Industry is observed in small and medium-sized firms within the city, large firms gain weight in agglomeration areas in the periphery and outside the city. Sitaler, which is currently going through a transition process, will continue to be one of the centres of the furniture industry with its history of more than half a century, its production culture and skill agglomeration, and its location in Ankara. How long Sitaler maintains and retains its historical and cultural

significance in the furniture industry remains unclear. What is clear however is that, this cluster will undergo a structural transformation as its competitiveness decreases; amongst other things, due to problems such as density of work, transportation problems, and infrastructure deficiencies.

In this framework, instead of continuing as a production focus, steps should be taken to support the design and retail identity of Siteler. Not only that, another strategy that ought to be considered is to move production to new production areas outside the city, because these areas offer larger and healthier production conditions. In the event that latter strategy isn't pursued, some form of high-value added artisanal production combined with technology can be sustained in Siteler for niche markets.

In conclusion, the traditional furniture industry, which is without doubt going through some form of revival, with new technologies, will take its place in the country's economy as a soaring potential in the coming years. In order to facilitate this, it is important to make more effective and widespread use of new technologies that play an active role in industrial and spatial restructuring processes, to develop cooperation with other institutions and organizations, and to expand activities on new technologies. It is also crucial that decision-makers examine the spatial formations caused by new technologies in terms of the furniture industry and to proffer recommendations where and when necessary, throughout this process. Thus, the findings of the study show that the spatial dynamics of the restructuring process based on new technologies are experienced differently by developed countries and developing countries such as Türkiye, depending on the international spatial division of labour and firm structure. Instead of focusing on mass production options, firstly, design intensive products with a diversification can be supported, contrary to the roles of developing countries in international division of labor. Secondly, by increasing specialization and customization, it becomes possible for firms to focus on high value-added niche markets.

ACKNOWLEDGEMENTS

We thank the anonymous reviewers and our colleagues for their comments and guidance on the development of the article. Ethics committee approval is not required for this study. We would like to express our special thanks Ahmet Burak Kaya for his patience, time and effort he provided in the process of bringing article figures into the format suitable for publication. All authors contributed equally to the article and there is no conflict of interest among the authors.

REFERENCES

- ABB (2007) 2023 Başkent Ankara Nazım İmar Planı Açıklama Raporu, Ankara.
- ABB (2017) 2038 Ankara Çevre Düzeni Planı Açıklama Raporu, Ankara.
- ANKARA DEVELOPMENT AGENCY (2012) Siteler, Mobilya ve Ankara, Ankara.
- ANKARA SANAYİ ODASI (2013) Bozkırdan Sanayinin Başkentine-Ankara Sanayi Tarihi, Ankara
- ANKARA SANAYİ ODASI (2014) Faaliyet Raporu-2015 Çalışma Programı, Ankara.

- AUTOR D.H., LEVY, F., MURNANE RJ (2003) The Skill Content of Recent Technological Change: An Empirical Exploration, *Q J Econ* (118) 1279-1333.
- BALABAN, O. (2001) Türkiye’de Organize Sanayi Bölgeleri Politikasına İlişkin Durum Değerlendirmesi, *Planlama* 2001(1) 61-75.
- BELLANDI, M., SANTINI, E., VECCIOLINI, C. (2018) Learning, Unlearning and Forgetting Process in Industrial Districts, *Cambridge Journal of Economics* (42) 1671-1685.
- BERTACCHINI, E.E., BORRIONE, P. (2013) The Geography of the Italian Creative Economy: The Special Role of the Design and Craft-Based Industries, *Regional Studies* 47(2) 35-147.
- BEYHAN, B. (2006) The Role of Labor Mobility in the Cognitive Architecture of an Industrial Cluster: The Case of Siteler in Ankara, Unpublished PhD thesis, Graduate School of Natural and Applied Sciences, Department of City and Regional Planning, Middle East Technical University, Ankara.
- BEYHAN, B. (2011). “Inter-Firm Social Networks Created by Mobile Laborers: A Case Study on Siteler in Ankara”, *Journal of Social Structure* 12(1) 1-33.
- BIANCHI, L., MARIOTTI I. (2003) Mezzogiorno and SEEC: Do They Compete in Attraction of Italian Relocating SMEs?, RSA International Conference, Reinventing Regions in The Global Economy
- BİLİM SANAYİ VE TEKNOLOJİ İL MÜDÜRLÜĞÜ.(2015) İmalat Sanayi Verileri, Ankara.
- BOSHMA, R.A., MARTIN, R. (2007) Constructing Evolutionary Economic Geography, *Journal of Economic Geography* (7) 537-548.
- BOSTAN, M. (2008) Ankara Metropolitan Alanında İmalat Sanayi Firmalarının Yer Değiştirme Süreci ve Özellikleri: Ampirik Bir Çalışma, Gazi Üniversitesi Fen Bilimleri Enstitüsü, Şehir ve Bölge Planlama Anabilim Dalı, Ankara.
- BOSTAN, M., ERDOĞANARAS, F., GÖRER TAMER, N. (2010) Ankara Metropolitan Alanı’nda İmalat Sanayinin Yer Değiştirme Süreci ve Özellikleri, *ODTÜ Mimarlık Fakültesi Dergisi* 27(1) 81-102.
- BULL, P.J. (1978). The Spatial Components of Intra-Urban Manufacturing Change. Suburbanization in Clyeside, 1958 -1968, *Transactions of Institute of British Geographers* 3(1) 91-100.
- COE, N.M., YEUNG, H.W. (2015) Global Production Networks: Theorizing Economic Development in an Interconnected World, Oxford: Oxford University Press.
- DERUNTZ, B.D., TURNER, R.M. (2003). Organizational Considerations for Advanced Manufacturing Technology. *The Journal of Technology Studies*, 29(1) 1-7.
- DOĞAKA (2014). TR63 Bölgesi Mobilyacılık Sektör Raporu, Hatay, Doğu Akdeniz Kalkınma Ajansı.
- DOMS, M., DUNNE, T., ROBERTS, M.J. (1995) The Role of Technology Use In The Survival And Growth of Manufacturing Plants, *International Journal of Industrial Organization* (13) 523-542.

- DRAYSE H. M. (2011). Globalization and Innovation in a Mature Industry: Furniture Manufacturing in Canada, *Regional Studies* 45(3) 299-318.
- ERDİL, E., DURGUT, M. PAMUKÇU, T., ÖZMAN, M., GÖKSİDAN, H.T., FINDIK, D., ÇETİN, C., ÇETİN, D., KEPENEK, B., ÇETİNKAYA, U.Y., TÜRKELİ, S. (2008), KÜSAİ, Kümeler, Sanayi Ağları ve İnovasyon: Ankara Bölgesi Makine ve Mobilya Sektörleri Örneği, Proje Sonuç Raporu, Ankara:STP.
- ERDOĞANARAS, F., EROL, D. (2016) The Impact of Manufacturing Industry Decentralization on Jobs-Housing Relationship and Commuting Behavior: The Case for The Sincan and Ostim Organized Industrial Districts, *Metu Journal of The Faculty of Architecture* 30(1) 139-63.
- ERDOĞANARAS, F., ÖNDAĞ, T. (2016) Mobilya Sektörünün Yeniden Yapılanması ve Mekansal Sonuçları: Ankara Örneği, TÜCAUM Uluslararası Coğrafya Sempozyumu Ankara 13-14 Ekim 2016 Bildiriler Kitabı; 624-642.
- ERDOĞANARAS, F., ÖNDAĞ, T. (2018) Yeni Teknolojilere Dayalı Olarak Ankara Mobilya Sektörünün Yeniden Yapılanması. TÜCAUM 30. Yıl Uluslararası Coğrafya Sempozyumu Ankara 3-6 Ekim 2018 Bildiriler Kitabı, 424-444.
- FAN, C.C., SCOTT, A.J. (2003) Industrial Agglomeration and Development: A Survey of Spatial Economic Issues in East Asia and A Statistical Analysis Of Chinese Regions, *Econ. Geogr.* (79) 295-319.
- FIRMAN, T. (1998) The Restructuring of Jakarta Metropolitan Area: A "Global City" in Asia, *Cities*15(4) 229-43.
- FRENKEN, K., BOSHMA, R.A. (2007) A Theoretical Framework for Economic Geography. Industrial Dynamics and Industrial Dynamics and Urban Growth as a Branching Process, *Applied Geography* (32) 143-157.
- FU, T., YANG, C., LI, L. (2020) Market Imperative and Cluster Evolution in China: Evidence from Shunde, *Regional Studies* (5482) 244-55.
- GAO, J., YUAN, F. (2017) Economic Transition, Firm Dynamics, and Restructuring of Manufacturing Sapces in Urban China: Emprical Evidence From Nanjing, *The Professional Geographer* 69(3) 504-19.
- GEREFFI, G. (1997) Facing The Challenge, Turkish Automobile, Steel and Clothing Industries. Responses to the Post-Fordist Restructuring, *Ford Foundation* 289-304.
- GIBBS, M. (2017) How is New Technology Changing Job Design, IZA World of Labor, 344.
- GLASMEIER, A. (1994) Flexible Districts, Flexible Regions? In A.Amin,N. Thrift(Eds) Globalization, Institutions and Regional Development in Europe(pp118-146),Oxford, UK: Oxford University Press.
- HADJIMICHALIS, C. (2006) The End Of Third Italy As We Knew It? *Antipode* (38) 82-106.
- HALL, R.E., JONES, C.I. (1999) Why Do Some Countries Produce so much Output Per Worker Than Others? *Quarterly Journal of Economics* (114) 83-116.

- HANSEN T., WINTHER L. (2014) Competitive Low-tech Manufacturing and Challenges For Regional Policy in the European Context— Lessons from the Danish Experience, *Cambridge Journal of Regions, Economy and Society* (7) 449–470.
- HASSINK, R. (2007) The Strength of Weak Links: The Renewal of The West-Munsterland Textile Industry, *Environment and Planning A*(39) 1147-1165.
- HASSINK, R., SHIN, D.H. (2005) The Restructuring of Old Industrial Areas in Europe and Asia, *Environment and Planning A* (39) 1147-65.
- HIRSCH-KREINSEN, H. (2008) Low Tech innovations, *Industry & Innovation* (15) 19-43.
- HUDSON, R. (2005) *Economic Geographies: Circuits, Flows and Spaces*, London,UK, Sage.
- IMRIE, R. F. (1989) Industrial Restructuring, Labour, and Locality. The case of the British Pottery Industry, *Environment and Planning A* 21(1) 3-26.
- KALLEBERG, A. (2003) Flexible Firm and Labor Market Segmentation: Effects of Workplace Restructuring on Jobs and Workers, *Work and Occupations* 30(2) 154-75.
- KAPLINSKY R., MORRIS, M., READMAN, J. (2002) The Globalization of Product Markets and Immiserizing Growth: Lessons From the South African Furniture Industry, *World Development* 30(7) 1159–77.
- KEPENEK, E.B. (2018) The Effects of Adoption of New Technology on the Employment of Young Apprentices: The Case of Furniture Sector in Söğüt, Ankara, *Journal of Sociological Research*,21(1),131-68.
- KRONENBERG, K. (2013) Firm Relocations in The Netherlands: Why Do Firms Move And Where Do They Go? *Pap. Reg. Sci.* (92) 691-713.
- KÜÇÜKERMEN, Ö. (2015) Sanayi-i Nefise Mektebi'nden Endüstri Tasarımına Mobilya, *Matsa Basımevi*, Ankara.
- LEIGH, N.G. (2000) Planning, Spatial, and Technological Considerations of Restructuring in the U.S. Woodworking Industry, *Economic Development Quarterly* 14(7) 204-20.
- LESLIE, D., REIMER S. (2003). Fashioning Furniture: Restructuring the Furniture Commodity Chain, *Royal Geographical Society, Area*35(4) 427–37.
- LESLIE, D., REIMER S. (2006) Situating Design in the Canadian Household Furniture Industry, *The Canadian Geographer* 50(3) 319–41.
- LI, X., TAN, Y., XUE, D. (2022) From World Factory to Global City-Region. The Dynamics of Manufacturing in The Pearl River Delta and Its Spatial Pattern in the 21st Century, *Land*,11,625.
- MARTIN, R., SUNLEY, P. (2006) Path Dependence and Regional Economic Evolution, *Journal of Economic Geography* (6) 395-437.
- MILLER, E.V. (2017) Industrialization on Chicagos Periphery: Examining Industrial Decentralization, 1893-1936, *Journal of Urban History* 43(5)720-43.
- MÜDERRİSOĞLU B., KORTEN F.G. (2015) Mevcut Yığılımların Kümelenmeye Dönüşümünde İlişkilerin , *Mekansal Dağılımı ve Yakınlık Olgusu, Planlama* 25(2) 107–21.

- NORTON, R.D., REES, J.(2007) The Product Cycle and teh Spatial Decentralization of American Manufacturing, *Regional Studies* 41(S1) 61-71.
- ÖZ, Ö. (2004) *The Furniture Cluster in Ankara*. In Clusters and Competitive Advantage, pp:60-83, Palgrave Macmillan, London.
- PORTER, M. (2000) Location and Competitive and Economic Development: Local Clusters in The Global Economy, *Econ. Dev. Q*(14) 15-34.
- RENSKI, H. (2008) New Firm Entry, Survival, and Growth in the United States: A Comparison of Urban, Suburban, and Rural Areas, *Journal of the American Planning Association* 75(1) 60-77.
- ROBB, D., XIE B. (2003). A Survey of Manufacturing Strategy and Technology in the Chinese Furniture Industry, *European Management Journal*, 21(4), 484–496.
- ROBB, D., ARTHANARI, T., XIE B. (2008) Supply Chain and Operations Practice and Performance in Chinese Furniture Manufacturing, *Science Direct, Int. J. Production Economics* (112) 683–699.
- SAVRAN S. (2020) Ankara’da Geçici Koruma Kapsamındaki Suriyelilerin Farklılaşan Gündelik Yaşam Pratikleri: Altındağ Örneği Gazi Üniversitesi Fen Bilimleri Enstitüsü Şehir ve Bölge Planlama Ana Bilim Dalı Basılmamış Doktora Tezi.
- SCHAMP, E.W. (2005) Decline of The District, Renewal of Firms, *Environment and Planning A* (37) 617-34.
- SCOTT, A.J. (1988) *Metropolis from The Division of Labor to Urban Form*, Berkeley, University of California Press.
- SCOTT, A.J. (2001/2004) Çeviren Cihangir Çamur, K. Küreselleşme ve Kent Bölgelerin Yükselişi. Planlama, 2004/3, 26-32.
- SCOTT A.J. (2006). The Changing Global Geography of Low-Technology, Labor-Intensive Industry: Clothing, Footwear, and Furniture, *World Development* 34(9) 1517–36.
- SCOTT, A.J. (2008a) Production and Work in the American Metropolis a Macroscopic Approach, *Ann Reg. Sci* (42) 787-805.
- SCOTT, A.J. (2008b) Patterns of Development in the Furniture Industry of Thailand: Organization, Location and Trade, *Regional Studies* 42(1) 17-30,
- SCOTT, A.J. (2009) Human Capital Resources and Requirements across the Metropolitan Hierachy of the USA.
- SCOTT, A.J. (2014) Beyond the Creative City: Cognitive-Cultural Capitalism and the New Urbanism, *Regional Studies* 48(4) 565-578.
- SCOTT, A.J., HALKETT E.C. (2013) The Geography of Celebrity And Glamour: Reflections On Economy, Culture, And Desire İn The City.
- SCOTT, A.J., STORPER, M. (2015) The Nature of Cities: The Scope and Limits of Urban Theory, *International Journal of Urban and Regional Research* 39(1) 1-15.
- SHEN, J., WU, F. (2013) Moving to The Suburbs: Demand Side Driving Forces of Suburban Growth in China, *Environment and Planning A* 45(8) 1823-44.

- STORPER, M., (1997) *The Regional World: Territorial Development in a Global Economy, Perspectives on Economic Change*. New York, NY: Guilford Press.
- TUİK (2017), İş İstatistikleri, Ankara.
- TRADE MAP (2016) Trade Statistics for International Business Development, İsviçre.
- TRAUTE, A., GATAUTIS, R. (2014) ICT Impact on SMEs Performance, *Procedia-Social and Behavioral Sciences* (110) 1218-25.
- UNIDO (2015) International Yearbook of Industrial Statistics, Vienna: United Nations Industrial Development Organization.
- WANG, Y. (2019) Spatial Adjustments of Furniture Industry. A Comparison of Spain and Denmark (2006-2015), Ph.D Thesis, Universitat Autònoma de Barcelona Department of Geography, Barcelona.
- WEISS, M., GARLOFF, A. (2005) Skill Biased Technological Change and Endogenous Benefits: The Dynamics of Unemployment and Wage Inequality. ZEW Discussion Paper,05, 79.
- WU, J., WEI, Y.D., LI, Q., YUAN, F. (2018) Economic Transition and Changing Location of Manufacturing Industry in China. A Study of the Yangtze River Delta, *Sustainability* (10) 2624
- YANG, C. (2012) Restructuring the Export-Oriented Industrialization in the Pearl River Delta, China: Institutional Evolution and Emerging Tension, *Applied Geography* (32) 143-57.
- YEUNG, H.W. (2009) Regional Development and the Competitive Dynamics of Global Production Networks: An East Asian Perspective, *Regional Studies* 43(3) 325-52.
- YEUNG, H.W.C., COE, N.M. (2015) Toward a Dynamic Theory of Global Production Networks, *Economic Geography* (91) 29-58.
- YILDIRIM, A., ŞİMŞEK, H. (2018) Sosyal Bilimlerde Nitel Araştırma Yöntemleri, Ankara, Seçkin Yayıncılık.
- YUAN, F., WEI, Y.H.D., CHEN, W. (2014) Economic Transition, industrial Location and Corporate Networks. Remaking Sunan Model Wuxi City, China, *Habitat International*, 42, 58-68.
- YUAN, F., GAO, J., WANG, L., CAI, Y. (2017) Co-location of Manufacturing and Producer Services in Nanjing, China, *Cities* (63) 81-91.
- ZHANG, L., YUE, W., LIU, Y., FAN, P., WEI, Y.D. (2018) Suburban Industrial Land Development in Transitional China: Spatial Restructuring and Determinants, *Cities*, (78) 96-107

Alındı: 11.06.2021; Son Metin: 12.05.2023

Anahtar Sözcükler: Mekansal yeniden yapılanma; yeni teknolojiler; mobilya sanayi; yığılma; Ankara.

ANKARA MOBİLYA SEKTÖRÜNDE YENİDEN YAPILANMA VE YENİ MEKANSAL EĞİLİMLER

Mobilya sektörü ulaşım ve iletişim alanındaki gelişmeler, küreselleşme, yeni üretim teknolojileri ve esnek üretim örgütlenme biçimlerinin etkisiyle, 1980'lerden sonra hem gelişmiş hem de gelişmekte olan ülkelerde yeniden yapılanmaktadır. Mobilya sektörünün sıradan üretimleri gelişmekte olan ülkelere kaydırılırken; tasarım ağırlıklı, katma değeri yüksek üretim gelişmiş ülkelerde tutulmakta ve yeni teknolojilere yapılan yatırımlarla niş pazarlara yönelik olarak gerçekleşmektedir. Gelişmekte olan ülkeler ise gelişmiş ülkelerin sıradan üretimlerini kaydırma sürecinden daha fazla pay kapabilmek için ihracat ağırlıklı üretim ve tasarıma yönelmekte, teknolojiye yatırım yaparak ve üretim altyapılarını geliştirerek yeniden yapılanma sürecine girmektedir. Yeni teknolojilerin belirsiz/değişken talep koşullarına uyum sağlamada sunduğu olanaklar, üretimde verimliliği ve kaliteyi artırarak rekabetin sağlanmasında önemli rol oynamaktadır.

Bu çalışmanın amacı, yeni teknolojilerin mobilya sektörünün mekânsal yeniden yapılanma sürecindeki etkilerini ortaya koymaktır. Alan çalışmasında 2000'in ortalarından itibaren yoğun olarak bilgisayar destekli tasarım ve imalat sistemlerinin üretim sürecine girdiği Ankara Mobilya Sektörü ele alınmıştır. Yeni teknolojilere dayalı yeniden yapılanma süreci sektörün Ankara Metropolitan Alanındaki mekânsal yapısını da dönüştürmektedir. Çalışmada olasılıklı olmayan amaca yönelik örneklem yöntemi kullanılmış, teknolojisini yenileyen 80 firma ile ve karşılaştırma imkanı vermesi açısından teknolojisini yenilemeyen 40 firma ile derinlemesine görüşmeler yapılmıştır. Firmalarla yapılan derinlemesine görüşmeler, yeni teknolojilerin firmalarda üretim organizasyonu ve işgücü süreçlerini değiştirerek yapısal ve mekânsal olarak yeniden yapılanma süreçlerini ortaya koymaktadır. Çalışma bulguları yeni teknolojilerin bir taraftan firmaların yer değiştirme ve yığılma/kümelenme eğilimlerini desteklediğini ortaya koyarken, diğer taraftan teknoloji yenileyen büyük firmaların önemli bir kısmının, küçük ve orta büyüklükteki işletmelere dayalı yığılma ve kümelenme alanlarına ilişkin yazından farklı olarak, kent çeperi ve dışındaki yeni yığılma alanlarında yer seçtiğini göstermektedir. Bu süreçte, organize sanayi sitelerinde sunulan dışsallıkların; organize olmayan alanlarda ise yerel yönetimin uygun arsa sunumlarını içeren teşviklerinin belirleyici olduğu görülmektedir.

RESTRUCTURING AND NEW SPATIAL TENDENCIES IN ANKARA FURNITURE SECTOR

The furniture industry has been restructured in both developed and developing countries after the 1980s with the impact of developments in transportation and communication, globalisation, new production technologies and flexible production methods. While the conventional production of the furniture industry is moved to developing countries, design-oriented, high value-added production is kept in developed countries and realised for niche markets through investments in new technologies. Developing countries, on the other hand, are turning towards an export-oriented production and design, investing in technology, and developing their production infrastructures to acquire a larger share in the process of moving the conventional production to developing countries. The opportunities offered by new technologies in adapting to uncertain/variable demand play an important role in ensuring competitiveness by increasing productivity and quality in production.

The purpose of this study is to reveal the effects of new technologies on the spatial restructuring process of the furniture industry. In the field study, the Ankara Furniture Industry, where computer-aided design and manufacturing systems have been intensively introduced into the production process since the mid-2000s, is taken into consideration. The restructuring process based on new technologies also transforms the spatial structure of the industry in Ankara Metropolitan Area. In the study, non-probability purposive sampling method was used, and in-depth interviews were conducted with 80 firms that have renewed their technology and 40 firms that have not renewed their technology in order to provide a comparison. In-depth interviews with firms reveal the structural and spatial restructuring processes of new technologies by changing the production organisation and labour processes in firms. While the findings of the study reveal that new technologies, on the one hand, support the relocation and agglomeration/clustering tendencies of firms, on the other hand, it indicates that a significant portion of large firms that renew technology have chosen to locate in new agglomeration areas in and outside the urban periphery, unlike the literature on agglomeration and clustering areas based on small and medium-sized firms. In this process, it is seen that the externalities offered in organised industrial zones and the incentives of the local government including the provision of suitable land in unorganised areas are decisive.

FATMA ERDOĞANARAS; B.CP, M.Sc., Ph.D.

Received her bachelor's degree from the City and Regional Planning Department at Middle East Technical University (METU) in 1986 and her M.Sc. and PhD. degrees from METU in 1989 and 2002 respectively. Her research interests include urban geography, urban planning issues, and sectoral studies focusing on industry and tourism. fatmaerdoganaras1862@gmail.com

KÜBRA CİHANGİR ÇAMUR; B.CP, M.Sc., Ph.D.

Received her bachelor's and master's degrees from the City and Regional Planning Department at Middle East Technical University (METU) and her PhD. degree from Ankara University. Her studies mainly focus on urban policies and urban geography; specifically the legislative framework of planning, planning-GIS, tourism geography, tourism entrepreneurship and urban protection. ccamurster@gmail.com

DEMET EROL; B.CP, M.Sc., Ph.D.

Received her bachelor's degree from the City and Regional Planning Department at Middle East Technical University (METU) in 1983 and her master's degree from Yıldız Technical University (YTU) in 1988. Earned her PhD. degree from Ankara University. Major research interests include urban policies, urbanization processes and migration policies. eroldemet@gmail.com

TUĞBA ÖNDAĞ; B.CP, M.Sc.

Graduated from the Department of City and Regional Planning at Gazi University and received her M.Sc. from the same university. tugbacakilci85@gmail.com

ALDO VAN EYCK'İN ARA ALAN KAVRAMININ GÖZDEN GEÇİRİLMESİ (1)

Tuğba ÖZER*

Alındı: 19.08.2021; **Son Metin:** 07.03.2023

Anahtar Sözcükler: Aldo van Eyck; ara; ara alan, Martin Buber.

1. Bu metin; yazarın, ODTÜ Mimarlık Doktora Programında Ela Alanyalı Aral danışmanlığında tamamlamış olduğu "From Relationlessness to Relatedness: Alienation and the In-Between Realm Revisited" isimli doktora tezinden üretilmiştir (Özer, 2022). Metinde geçen alıntılar yazar tarafından çevirilmiştir.

2. CIAM (Congrès Internationaux d'Architecture Moderne [Uluslararası Modern Mimarlık Kongreleri]); ilk olarak, Le Corbusier, Sigfried Giedion ve Hélène de Manrot tarafından İsviçre'de La Sarraz şatosunda 26-29 Haziran 1928'de düzenlenir. Dönemin mimarlık ve planlama sorunlarıyla ilgilenmeyi ve modern akımı dünyaya yaymayı amaçlar. İkinci Dünya Savaşı sonrasında düzenlenen ilk CIAM kongresi 6. CIAM kongresidir.

GİRİŞ

Hollandalı mimar Aldo van Eyck; 1947 yılında Bridgwater'da (İngiltere) İkinci Dünya Savaşı sonrasında düzenlenen ilk CIAM kongresinde (2) kritik ve aynı zamanda retorik bir soru sorar: "CIAM, insan çevresinin iyileştirilmesine yönelik rasyonel ve mekanik bir ilerleme anlayışına 'rehberlik etmeyi' amaçlıyor mu? Yoksa bu anlayışı değiştirmeye mi niyetli?" (van Eyck, 2008, 42). "Cevap konusunda herhangi bir şüphe olabilir mi? Yeni bir medeniyet doğuyor. Ritmi zaten tespit edildi, ana hatları kısmen izlendi. Devam etmek bize kalmış" (van Eyck, 2008, 42) diye devam ederek gelecek konusunda iyimser görüldüğünün sinyallerini verir. Savaş öncesi dönemde kentlerin "barınma, dinlenme, çalışma, ulaşım" olarak bölümlere ayrılmasının aksine van Eyck'in belirttiği bu yeni medeniyetin ilişkilerden oluşması beklenir. Nitekim, yine aynı kongrede, van Eyck'in Piet Mondrian'ın "Belirli bir formun kültürü sona yaklaşıyor. Belirlenmiş ilişkiler kültürü başladı" (Alıntılanan van Eyck, 2008, 36) ifadesine atıfta bulunması tesadüfi değildir. Bu alıntıyla ilişkilere vurgu yapan van Eyck, Modern mimarlık camiasında ilişkilerin önemini ortaya koyan ilk kişidir (Strauven, 1994/1998, 471). İlerleyen dönemlerde, şeyler arasındaki ilişki fikri Sigfried Giedion'ın, Alison ve Peter Smithson'ın, Jacob Bakema'nın düşüncelerinde ve (eserlerinde de) gözlemlenir.

Bu metin, şeyler arasındaki ilişkinin van Eyck'in geliştirdiği ara alan (*the in-between realm*) kavramıyla kapsamlı olarak ele alındığını ve çok anlamlı hale geldiğini iddia eder. Martin Buber'in ara alan (*das Reich des Zwischen*) kavramının ve dönemin önde gelen avangart kaynaklarının etkisiyle oluşan ara alan kavramı (Strauven, 1994/1998, 352), çatışan zıtlıklar için ortak bir zemin sağlayarak çeşitli ilişki biçimleri sunar.

Ara alanın sağladığı birtakım ilişki biçimleri; ara mekân (*in-between space*), gözeneklilik (*porosity*), yumuşak kenar (*soft edges*), belirsiz sınırlar (*ambiguous edges*), eşik (*threshold*), eşik mekân (*liminal space*) gibi kavramlar aracılığıyla da ifade edilir (3). Özellikle ara mekân kavramı

* Department of Architecture, Faculty of Architecture, Middle East Technical University, Ankara, TÜRKİYE.

3. Walter Benjamin ile Asja Lacis'in (1924/2006, 167-176) Napoli üzerinden anlattıkları gözeneklilik (*porosity*) kavramı, özel ve kamusal, eski ve yeni, iç ve dış gibi zıtlıklar arasında net bir sınırın olmadığını ifade eder.

Jan Gehl'in (1971/2011; 2010) kullandığı yumuşak kenar (*soft edge*) kavramı da içeri ile dışarı arasındaki ve kamusal alan ile özel alan arasındaki ilişkileri tarifler. Yarı saydam cepheler, açıklıklar, balkonlar, ön bahçeler tasarlanarak yumuşak kenar oluşturulabilir.

Belirsiz kenarlar (*ambiguous edges*), Richard Sennett'in Jane Jacobs'tan esinlenerek geliştirdiği açık şehir (*open city*) kavramının bir ögesidir. Sennett; şehirleri daha açık hale getirmenin, insanların deneyimlerini, kendilerinden farklı insanlarla daha fazla yaşayabilecekleri şekilde zenginleştirilebileceğini savunur. Bu hususta, etkileşime imkân yaratan gözenekli kenarlara sahip sınırları ifade eden belirsiz kenarlar yaratmak şehrin tasarımıyla etkileşime açılabilmesini gösterir (Sennett 2017; 2018/2019).

4. Martin Buber'den ve Aldo van Eyck'tan esinlenen Herman Hertzberger, van Eyck'in ara alan kavramına benzer bir yaklaşım geliştirir. Bu yaklaşımdan bahsederken hem ara alan (*in-between realm*) hem de ara mekân (*in-between space*) terimlerini kullanır (Hertzberger, 1991/2001). Benzer şekilde, van Eyck'in ve Hertzberger'in çalışmalarına referans veren Yiğit Yalçın (2016) ile Femke Vink (2021), yüksek lisans tezlerinde, ara alan kavramı yerine ara mekân kavramını kullanmışlardır.

5. 1954 yılında, CIAM'ın genç mimarlarından Jacob Bakema, George Candilis, Rolf Gutmann, Peter Smithson, CIAM 10 için bir program hazırlama görevi verilen CIAM X Komitesi'ne (CIAX) atanırlar (Risselada ve van den Heuvel, 2005, 43). Komiteye daha sonra Aldo van Eyck, Bill ve Gill Howell, Alison Smithson, John Voelcker ve Shadrach Woods da katılır. Bu genç üyelerden bazıları daha sonra Team 10 olarak anılır. Gerek modern hareketin mimari düşünce süreçlerindeki eksikliklerinin ortak kabulüyle gerek her birinin diğerinin yeni bir başlangıca giden yolu çoktan keşfettiğini fark etmesiyle bir araya gelirler (Smithson, 1968, 3). Grubun çekirdek üyeleri Jacob Bakema, Georges Candilis, Giancarlo de Carlo, Aldo van Eyck, Alison ve Peter Smithson ve Shadrach Woods'tur (Team 10 Online).

6. İngiliz şair ve ressam William Blake (1757 – 1827), karşıtlıkları tamamlayıcı olarak görür. Masumiyet ve Deneyim Şarkıları (*Songs of Innocence and of Experience*) adlı çalışmasında, çocukluk (masumiyet) ve yetişkinlik (deneyim) ikili karşıt olarak kabul edilir. Ancak, bu ikili, birbirlerini tamamlamalarıyla anlam kazanırlar (Canlı, 2019).

ara alan kavramının muadili olarak kullanılabilir (4). Ancak, ara mekân kavramının ara alan kavramından farklılık gösteren kullanımları da mevcuttur. Ara mekân; fiziksel ve sosyal dünyaları ayıran çatlak (Loukaitou-Sideris, 1996, 91), artık alan (*leftover space*) (Azhar ve Gjerde, 2016, 4), boşluk (*gap*) (Brosius ve Schilbach, 2016, 1-6), farklı kullanımlara sahip yapıları birbirinden ayıran, şehri bölen ve engeller yaratan sınır (Rembeza ve Sas-Bojarska, 2022, 33) olarak görüldüğü gibi dışarı ile içeri arasındaki alan (Nooraddin, 1996; 1998), özel alan ile kamusal alan arasındaki alan (Hertzberger 1991/2001; Can, 2012; Can ve Heath, 2015; Aelbrecht, 2016), kamuya açık deneyimler (ötekiyle karşılaşma, fikir alışverişi yapma) sunabilen eşik mekân (Hajer ve Reijndorp, 2002, 128-9) olarak da tanımlanır. Özellikle ilişkilene sağladığı tanımlarda çoğunlukla sosyal mekân olarak ele alınır ve sosyal etkileşimi teşvik edecek şekilde tasarlanır (Can, 2012; Can ve Heath, 2015; Aelbrecht, 2016). Öyle ki Ali Madanipour (2003, 235), kamusal alanı, bir arada bulunmayı kolaylaştıran ve kişiler arası ilişkileri düzenleyen ara mekân olarak tanımlamaktadır.

Van Eyck'in geliştirdiği ara alan kavramı da içeri ile dışarı yahut kamusal alan ile özel alan arasında ilişkilene sağlayıp sosyal etkileşimi teşvik ediyor olsa da yalnızca bu kullanımlarla sınırlı kalmayıp parça ve bütün, düzen ve kaos, bireysel ve kolektif gibi diğer pek çok zıtlık arasında da dengeli bir ilişkilene önerir. Düşünsel derinliği olan bu kavram, teori ile sınırlı kalmayarak van Eyck'in yapıları çevreye dahil olan projeleriyle gündelik yaşamın içine karışır ve insanlara etki eder. Bu sayede, mimarlık ve diğer disiplinler arasında da bir ara alan oluşmasına imkân yaratır.

Bu metin, Buber'in ara alan kavramına kısa bir ön bilgi verip van Eyck'in geliştirdiği ara alan kavramına odaklanır, bu kavram çerçevesinde van Eyck'in çeşitli disiplinlerden beslenerek geliştirdiği mimari düşünce biçimine bir kapı aralar ve ara alan kavramının van Eyck'in mimari düşüncesinde nasıl tezahür ettiğini inceleyerek kavramın çok anlamlılığını ortaya çıkarmayı hedefler.

ALDO VAN EYCK

İkinci Dünya Savaşı sonrası dönemin öncülerinden olan mimar Aldo van Eyck (1918 – 1999), CIAM'ın genç üyelerinden, Team 10'ın (5) kurucularından ve Hollandalı mimarlık dergisi *Forum*'un editörlerindedir. Genellikle Amsterdam'da tasarladığı yaklaşık 700 adet oyun alanıyla bilinir. Tasarımları ve tasarımlarının ardında yatan felsefe; mimarlık alanı dışında antropoloji, bilim, felsefe, sanat ve şiir gibi pek çok disiplinden beslenir.

Şair ve düşünür Pierre van Eyck'in oğlu olması ve çocukluğunun belli bir dönemini İngiltere'de geçirmesi; iki kültürlü bir dünyada şiirle iç içe büyümesine, Beowulf'tan William Butler Yeats'e, Andrew Marvell'dan John Keats'e pek çok şairi okumasına ve William Blake'nin şiirlerindeki karşıtların etkileşimine (6) daha ilk gençlik yıllarında aşına olmasına imkân yaratır (Strauven, 2007, 2-3, 15). Bu zenginlik, Sigfried Giedion'un eşi Carola Giedion-Welcker ile tanışmasıyla daha da artar. ETH Zürih'den (Eidgenössische Technische Hochschule Zürih) mezun olmadan kısa bir süre önce Yves Tanguy, Salvador Dali ve Max Ernst'in düzenlediği bir sergi açılışında tanıştığı ve "pencerelerimi açtı - ve açtığından bu yana da kapatmadı; tellerimi akort etti - ve tellerim bir daha akorda ihtiyaç duymadı" (van Eyck, 2008, 18) diye söz ettiği Giedion-Welcker, van Eyck'in hayatında zamanla önemli bir yere sahip olur. Giedion-Welcker;

7. Gerçek ismi Hans Peter Wilhelm Arp'tır; ama genellikle Jean Arp olarak bilinir.

8. Harika çeteyi mimarlık camiasına tanıtmayı amaçlayan van Eyck, 1959'daki Otterlo Toplantısı'ndaki konuşmasında onlardan ayrıntılı olarak bahseder (van Eyck, 1962/2008, 58):

"Onların hikâyesini yeniden anlatmaya çalışmayacağım. Bu, başkaları tarafından hem iyi hem de kötü bir şekilde yapıldı. Her şeyden önce, mimar-eleştirmene büyük çeteden ve başlattıkları başkaldırının doğasından değinmek istiyorum; yaptıklarına, yazdıklarına ve düşüdüklarine ve, daha önce bir kez yapmış olması gerektiğine, tekrar yapmasına – bunu yapmaktan asla vazgeçmemesine – çünkü getirdikleri mucize hâlâ mimarlığın çeperinden daha fazlasını etkilemedi. Başkaldırıya katılanların ve açık kapılardan geçenlerin sayısı arttıkça bu mucizenin daha da mucizevi hale geleceğine inanıyorum" (van Eyck, 1962/2008, 29).

9. Van Eyck (2008, 545); Alvar Aalto, Gerrit Rietveld, Jan Duiker, Leendert van der Vlugt, Le Corbusier ve Owen Williams'ı istisna olarak görür.

10. Van Eyck, Zürih'te yaşarken, antika ürünler satan bir kitapçıda bu derginin eski bir sayısını bulur. Afrika'da etnolojik bir geziye adanan dergi, maskelerin ve diğer kült nesnelerin resimlerini ve bir Dogon cenaze töreni hakkında bir makaleyi içermektedir (Strauven, 2002; Strauven, 2007, 5).

genç van Eyck'e mentorluk yapmakla kalmaz aynı zamanda onu Alberto Giacometti, Constantin Brancusi, Georges Vantongerloo, Jean Arp (7), Max Ernst ve Richard Paul Lohse gibi çeşitli avangart sanatçılarla tanıştırır (Strauven, 2007, 3-4). Bu tanışıklıklar, van Eyck'in "yabancı bir dünyada ruhun soyluları için bir sığınak" (van Eyck, 1962/2008, 34) olarak gördüğü Zürih'teki Giedion Evi'nin düzenli bir ziyaretçisi olmasıyla ve diğer düzenli ziyaretçilerle karşılaşmasıyla pekişir. Böylelikle van Eyck de harika çete (*wonderful gang*) yahut büyük çete (*great gang*) (8) olarak gördüğü çeşitli disiplinlerden avangartların dünyasına dahil olur.

Van Eyck, harika çetenin yeni düşünme biçimini keşfederken bu yeni düşüncenin, her şeyin her şeyle göreceli olduğunu öne süren görelilik fikri üzerine temellendiğini fark eder. Aslında görelilik fikri Albert Einstein'ın Özel Görelilik Kuramı (1905) ve Genel Görelilik Kuramı'ndan (1916) gelmektedir; ama van Eyck'e göre görelilik fikri Einstein'ın teorileriyle sınırlı değildir ve genel olarak harika çetenin düşüncesini temsil etmektedir (van Eyck, 1962/2008, 47). Her ne kadar van Eyck görelilik fikrini 20. yüzyıl sanat ve biliminin paradigması olarak görse de (Strauven, 2007, 4), bahsi geçen avangartların aksine modern mimarlar - birkaç istisna dışında (9) - göreliliğin mekân ve zamanı yeniden değerlendirme üzerindeki etkisinden habersizdir (van Eyck, 1962/2008, 48). Van Eyck ise görelilik fikrinin özellikle farkındadır ve bu yeni düşünceyi sürdürmek hususunda kendisini sorumlu hisseder (Henket, 2018, 56). Mimari düşüncesine şekil veren görelilik fikri, felsefesinin çatı terimi haline gelir ve ara (*in-between*), ikiz fenomenler (*twin phenomena*) ve doğru-boyut (*right-size*) gibi birçok farklı kavrama ayrılır (Jaschke, 2012, 196, 238, 306).

20. yüzyıl avangardı, van Eyck'i görelilik fikriyle tanıştırmakla kalmaz aynı zamanda van Eyck'in arkaik kültürler hakkında bilgi sahibi olmasını da sağlar. Sürrealizm akımı ve özellikle de André Breton ve arkadaşlarının yazıları van Eyck'in arkaik kültürlerle olan ilgisini uyandırır. Daha sonra sürrealist dergi *Minotaure* (10) aracılığıyla Dogon kültürüyle tanışan van Eyck, Cezayir Sahrası, Mali'de Dogon, New Mexico'da Pueblolar ve dünyadaki diğer birçok arkaik kültürü ziyaret eder (Strauven, 2002). Gerek bu ziyaretleri gerek Franz Boaz, Margaret Mead ve Ruth Benedict gibi antropologlarla tanışması Batı medeniyetinin diğer kültürlerden üstün olmadığını ve "tüm kültürlerin eşit derecede geçerli" olduğunu anlaması için fırsat yaratır (Strauven, 2002). Kenneth Frampton'a (1980/1982, 276) göre van Eyck'in arkaik kültürlerle ve bu kültürlerin yapılarındaki zamansız ve değişmez yönlerine olan bu kişisel ilgisi, onun benzersiz bir konum geliştirmesini sağlar.

BUBER'İN ARA ALAN KAVRAMI

Avusturya doğumlu Yahudi düşünür Martin Buber (1878 – 1965) genellikle diyalog felsefesi ile bilinir. Hocaları Wilhelm Dilthey ve Georg Simmel'in kuramlarıyla, Ludwig Feuerbach'ın, Friedrich Nietzsche'nin ve Soren Kierkegaard'ın felsefelerinden yararlanarak düşünme biçimini geliştirir (Friedman, 1999, 404; Moseley, 2015, 29, 104-8).

Buber'e (1923/1970) göre iki türlü ilişki biçimi vardır: Ben-Sen (*I-Thou*) ve Ben-O (*I-it*). Ben-Sen ilişkisini veya Ben-O ilişkisini tanımlayan şey, ilişkinin bileşenleri değil ilişkinin kendisidir. Maurice Friedman (2004, xiv) bu ilişkiyi şöyle açıklar:

Ne kişiler arasındaki her ilişki Ben-Sen ilişkisidir ne de bir hayvan ya da bir şeyle olan her ilişki Ben-O ilişkisidir. Aralarındaki fark, daha ziyade,

ilişkinin kendisindedir. Ben-Sen; bir açıklık, doğrudanlık, karşılıklılık ve mevcudiyet ilişkisidir. İnsanla insan arasında olabilir; ama aynı zamanda bir ağaçla, bir kediyle, bir mika parçasıyla, bir sanat eseriyle ve tüm bunlar aracılığıyla, ilişkilerin paralel çizgilerinin bulunduğu “ebedi Sen” olan Tanrı ile de olabilir. Ben-O ise, tam tersine, kişinin diğer kişileri veya şeyleri kendi benzersizlikleri içinde var olmalarına izin vermeden bildiği ve kullandığı tipik özne-nesne ilişkisidir.

Bu bağlamda, Ben-Sen ilişkisi bir diyaloga, Ben-O ilişkisi ise bir monoloğa tekabül etmektedir (Friedman, 1955, 297). Buber’e, gerçek diyalektiğin “yalnız düşünürün kendisiyle monoloğu değil, Ben ve Sen arasındaki bir diyalog” olduğunu öğreten de Feuerbach’tır (Buber, 1947/2004, 32).

Buber (1923/1970, 69, 80), gerek “O kozadır, Sen kelebektir” gerekse “İnsan bir Sen aracılığıyla Ben olur” diyerek Ben-Sen ilişkisinin bileşenlerinin tamamlayıcı olduğunu vurgular. Kuşkusuz O olmadan insanın yaşayamayacağını da bilincindedir; ama her kim sadece Onunla yaşarsa da insan değildir (Buber, 1947/2004, 85). Dolayısıyla, insanın izole bir birey olamayacağını kişinin gerçek benliğini bulmak için başkalarına ihtiyaç duyduğunu savunur: “Bireyler arasındaki karşılıklı ilişkiler yoluyla, izole bireylerde mümkün olmayan yeni değerler, yeni psikik gerçekler yaratılır” (Martin Buber, alıntılan Friedman, 1999, 404). Bu demek değildir ki Buber bireyciliğe karşı kolektivizmi destekler. Aksine, kolektif bir oluşumun içinde yer alan bir insanın diğer bir insanla ilişkilendiğini çünkü kolektivizmin insanı değil de sadece toplumu gördüğünü, bunun da izole edilmiş bireyi daha da izole ettiğini savunur (Buber, 1947/2004, 237, 239). Bu nedenle, ne bireyle ne de topluluk ile değil sadece insan ve insan arasındaki karşılıklı ilişkinin gerçekliği ile bu özün kavranabileceğini iddia eder (Buber, 1947/2004, x). İnsan ile insan arasındaki bu karşılıklı ilişkiyi de ara alan (*das Reich des Zwischen*) olarak adlandırır: “İnsanın insan olarak varoluşuyla kurulan ama kavramsal olarak henüz anlaşılmamış olan bu alana ben, ‘ara’ alan diyorum” (Buber, 1947/2004, 241). Buber’e göre, “öznel olanın uzak tarafında, nesnel olanın bu tarafında, Ben ve Sen’in bulunduğu bu dar sırtta, ‘ara’ alan vardır” (Buber, 1947/2004, 243).

Ara alan, aynı zamanda, gerçek bir topluluk oluşturmak için gerçek Ben ve Sen’in bir araya gelmesine yardımcı olan gerçek üçüncüdür (*genuine third*) (Buber, 1947/2004, 243). Bu hususta, gerçek Ben ve Sen’in buluşmasına olanak sağlayan ve bu buluşmaları anlamlandıran ortamlar tasarlanması için Buber mimarlara çağrıda bulunur (Teyssot, 2011, 52; Avermaete, 2016, 28). Onun bu çağrısı bazı mimarlar tarafından ciddiye alınmış olmalı ki Buber’in ara alan kavramı CIAM ve Team 10 içindeki mimari düşünceye etki etmiştir (van den Heuvel, Martens ve Muñoz Sanz, 2021, 16). Buber’in düşüncelerinin yansıması ilk olarak 1952’deki Sigtuna Konye Toplantısı’nda, Rolf Gutmann ve Theo Manz’ın habitat kavramında gözlemlenebilir (Strauven, 1994/1998, 243). Sen ile ben arasındaki ilişkinin yeniden kurulması talebinin şehrin yapısında köklü değişikliklere yol açtığını belirten Sigfried Giedion da (1958, 203) (11), Buber gibi, gerçek bir kent kurmak için insan ile insan arasındaki ilişkinin gerekliliğini vurgular:

Şehre, özel hayatın toplum hayatı ile bulunduğu bir yer olarak bakarsak, o halde, gerçek bir şehrin işareti SEN ve BEN arasındaki dengedir. Bugün yeniden kurmamız gereken bu sen ve ben ilişkisidir. Hiçbir makine fiziksel yakınlığın yerini alamaz, ne telefon ne radyo, ne ev sineması ne de televizyon. (Giedion, 1958, 124)

Bu metnin akışında da belireceği üzere Buber’in mimarlar üzerindeki etkisi en belirgin biçimiyle van Eyck’in mimari düşüncesinde ve yapılı

11. Georges Teyssot’a (2011, 52) göre Buber, aynı zamanda Giedion’un 1958’de yazdığı Mimarlık, Sen ve Ben: Bir Gelişimin Günlüğü (*Architecture, You and Me: The Diary of a Development*) adlı kitabının başlığının da ilham kaynağıdır.

çalışmalarında gözlemlenebilmektedir. Bu etkinin izlerine van Eyck'in *Forum* dergisinde yayın kurulunda yer aldığı dönemde de rastlanır. *Threshold and Encounter*, *Day and Night* ve *Door and Window* sayılarının başlıkları ara alan kavramına gönderme yapar (Jaschke, 2012, 238-9) ve *Threshold and Encounter* sayısı Buber'in *Das Problem des Menschen* adlı kitabının son bölümünden alıntı ile başlar (Strauven, 1994/1998, 352). *Forum*'un yayın kurulunda yer alan Herman Hertzberger de Buber'in fikirlerinden haberdardır. Gerek Buber'in gerek van Eyck'in Hertzberger üzerindeki etkisi de Hertzberger'in kavramsal ve yapısal çalışmalarında fark edilebilir (Hertzberger, 1991/2001).

VAN EYCK'İN ARA ALAN KAVRAMI

Daha önce de ifade edildiği gibi hem Buber'in ara alan kavramınının hem de dönemin avangart kaynaklarınının yansımaları van Eyck'in ara alan kavramında görülebilir. Oliver Sack (2019, 191), Buber'in mekânsal olmayan ara alan kavramının van Eyck tarafından mekânsal bir kavram olarak yorumlandığını iddia eder. Van Eyck'in yorumu mekânsal olmakla kalmaz çok boyutlu ilişkiler sunar.

Van Eyck, 1953 yılında düzenlenen 9. CIAM toplantısında, Smithsonların eşik (*doorstep*) felsefesini duyduğunda bu mekânsal yoruma ilk olarak *la plus grande réalité du seuil* yani eşik'in daha büyük gerçekliği adını verir: "Yeni beşeri ortam, insanla insan, insanla şey arasındaki birincil teması yansıtmalı ve teşvik etmelidir - buna 'eşik'in daha büyük gerçekliği' diyoruz" (van Eyck, 2008, 191). 1959 yılındaki Otterlo Buluşması'nda, kapı eşik'i ile ara alan arasındaki ilişkiyi şöyle ifade eder: "Ara'yı kurmak, çatışan kutupları uzlaştırmaktır. Değiş tokuş edebilecekleri yeri sağlayın ve orijinal ikili fenomenleri [*dual-phenomena*] yeniden kurun. Ben buna Dubrovnik'te '*la plus grande réalité du seuil*' adını verdim. Martin Buber ise buna '*das Gestalt gewordene Zwischen*' diyor" (van Eyck, 2008, 204).

Her ne kadar *la plus grande réalité du seuil* van Eyck'in mimari düşüncesinde çeşitli biçimlerde varlığını sürdürse de ara alan eşik fikrinden daha kapsayıcı bir anlam önerir. Van Eyck (1962/2008, 55) eşik fikrinin ara alan fikrini kapsamadığını, ara alanın daha fazla çağrışımı olduğunu ifade eder. Ara alan; "birlik ve çeşitlilik, parça ve bütün, küçük ve büyük, çok ve az, basitlik ve karmaşıklık, değişim ve sabitlik, düzen ve kaos, bireysel ve kolektif" gibi kutupların bir araya geldiği, ilişki kurabildiği ve uzlaşabildiği bir yerdir (van Eyck, 2008, 327). Bu tanımdan da anlaşılacağı gibi ara alan sadece kamusal alan ve özel alan arasındaki keskin sınırları hafifletmek için kullanılmaz. Kavramı yalnızca sosyalleşme mekânı olarak ifade etmek "denge içinde çoklu anlam" (van Eyck, 1962/2008, 55) sunan ara alanın kapsamını eksiltir. Çokluğun deneyimlenebildiği böyle bir ara alan kara ve okyanus arasında doğal olarak şu şekilde oluşabilir:

Ayakkabılarınızı çıkarın ve okyanusun karaya ve denize doğru süzülen son ince su tabakasında bir kumsal boyunca yürüyün. Bu harika fenomenlerden biri veya diğeri ile aranızda zorunlu bir diyalog olsaydı hissetmeyeceğiniz bir şekilde uzlaştığınızı hissedersiniz. Çünkü burada, kara ile okyanusun arasında - bu ara alanda - denizcilerin karşılıklı nostaljisinden oldukça farklı bir şey başınıza gelir. Denizden karaya hasret yok, karadan denize hasret yok. Alternatif özlemi yok - birinden diğerine kaçış yok. (van Eyck, 1962/2008, 56)

Kara ve okyanus arasında oluşan bu ara alan Piet Mondrian'ın Kompozisyon 10, İskele ve Okyanus (*Composition No. 10 Pier and Ocean*) isimli tablosunu hatırlatır. Her ne kadar van Eyck bu esere referans

12. Van Eyck, Dogon'a yaptığı ziyaretlerden sonra ikiz kozmolojinin de etkisiyle, ikili fenomenleri (*dual phenomena*) ikiz fenomenler (*twin phenonena*) olarak yeniden adlandırır (Ligtelijn, 1999, 14). Her ne kadar van Eyck'in 1961'den sonra yayınlanan metinlerinde ikiz fenomenler kelimesi yer almaya başlasa da 1952 yılında *Forum* dergisinde İsviçreli ressam Richard Paul Lohse hakkında yazdığı metinde kavram kendini göstermeye başlar (van Eyck, 2008, 56). Van Eyck'in metinleri yeniden basıldığında, ikili fenomenler kavramı ikiz fenomenler olarak değiştirilir (van Eyck, 1999, 88).

13. "Ama bireycilik insanın yalnızca bir parçasını anlıyorsa, kolektivism insanı yalnızca bir parçası olarak anlar: ikisi de insanın bütünlüğünü, bir bütün olarak insanı ortaya atmaz. Bireycilik insanı yalnızca kendisiyle ilişkisi içinde görür, kolektivism ise insanı hiç görmez, yalnızca 'toplum' görür. İlkile insanın yüzü çarpıktır, ikincisi ile ise maskelidir" (Buber, 1947/2004, 237).

vermemiş olsa da Mondrian'ın van Eyck üzerindeki tesiri göz önünde bulundurulduğunda van Eyck'in bu eserden esinlendiği çıkarımında bulunmak mümkündür.

Van Eyck'in Otterlo konuşmasında daha önce bahsedildiği gibi, ara alanda bir araya gelen kutuplar ikili fenomenler (*dual phenomena*, Flemenkçede *duo-fenomenen*) haline gelir. Daha sonra ikiz fenomenler (*twin phenomena*) (12) olarak adlandırılan ikili fenomenler, van Eyck'in ara alandan yola çıkarak geliştirdiği bir kavramdır. İkiz fenomenler kutupları uzlaştırarak diyalektik düşünmeyi önerir; ama bu diyalektik düşünme Hegel diyalektiğinden farklı işler. Van Eyck (1962/2008, 91), eşdeğerlikle ya da karşıtların birliği ile ilgilenmediğini ama belirsizlikle ilgilendiğini, dolayısıyla ortaya koyduğu kavramda hiçbir Hegelci çıkarımın aranmaması gerektiğini vurgular.

Çelişkilerin veya zıtlıkların daha yüksek ve daha zengin bir düzeyde sentez olarak birleşmek için orijinal kimliklerini yitirdiği Hegel diyalektiğinin (Hegel, 1812-1816/2010, 33) aksine ikiz fenomenler kavramı, zıtlıkların orijinal kimliklerini kaybetmediği bir uzlaşma sunar. Her ne kadar ikiz fenomenleri oluşturan kutuplar birbirinin tamamlayıcısı olsa da (Strauven, 2007, 1-2) kutupların uzlaşması ne birbirini nötrleştirir ne de tamamen yeni bir şey oluşturur (Coleman, 2005, 201-2; Sack, 2019, 204). Bunun yerine, uzlaşma kutupları fark edilebilir ve ölçülebilir kılar (Ligtelijn, 1999, 15) ve kutuplar bölünmüş fenomenler olarak bir arada var olur (Coleman, 2005, 202). Böylece kutuplar arasındaki ilişki Ben-Sen ilişkisini sunar. Van Eyck'in asıl kaygısı, tıpkı Buber gibi, kutupların orijinal varlıklarını kaybetmeden kutuplar arasında gerçek bir ilişki kurmaktır.

Van Eyck'in vurguladığı ikiz fenomenlerden biri bireycilik ve kolektivism ikiz fenomenidir. Buber'e referans veren van Eyck, bireyciliği veya kolektivismi kendi başına düşünmenin hayal kırıklığına, izolasyona ve umutsuzluğa yol açtığını, bireycilik ve kolektivismin bölünemez ikiz bir fenomen oluşturduğunu ileri sürer:

Bireyciliğin insanın bir parçasını ima ettiğini, kolektivismin ise insanı bir parçası olarak kastettiğini söyleyen Martin Buber'di (13). Bunu o söyledi ve bölünemeyen ikiz fenomenin bölünmesine karşı çıktı.

Buber'i daha da takip edecek olursak: Kolektivism insanı hiç görmezken, bireycilik insanı kendisiyle ilişkili olarak görür. Bu bence inanılmaz doğru! Çünkü yalnızca kendisiyle ilgili olan ya da hiç ilişkisi olmayan şey göreliliği karıştırır ve soyut bir mutlakta donup kalır. Ve insana ait olan hiçbir şey ne soyut ne de mutlaktır.

Buber, her iki kavramın da aynı insani durumdan doğduğunu söylüyor - her ikisi de hayal kırıklığına, izolasyona ve umutsuzluğa yol açar. Ne biri ne de diğeri insanın bütünlüğüne giden yolu açamaz, çünkü sadece gerçek insanlar arasında gerçek birlikler olabilir. Elbette, insanın (gerçek insanları ima ederek) bütünlüğünün ya bireysellik ya da kolektivism gibi soğuk soyutlamanın ötesinde olduğunu, ancak her ikisine de başka bir (gerçek) boyutta ihtiyacı olduğunu kastediyor. Her ikisi de eşit derecede soyut ve dolayısıyla eşit derecede gerçek dışı olduğu için, onun sözcüklerini tekrar kullanırsak, her ikisi de bir insanla başka bir insan arasındaki yolu temizleme yeteneğine sahip değildir, çünkü insanın temel gerçekliği bir insan ve bir başka insandır - insan ve diğer insanlar. (van Eyck, 1962/2008, 54)

Van Eyck; bireyciliğin ve kolektivismin, her ikisinin de erişebileceği bir boyutta, yani ara alanda, buluşması gerektiğini savunur:

Gerçek kişiler arasında yalnızca bir gerçeklik vardır - Buber'in 'gerçek üçüncü' dediği şey. Onun sözlerini yorumlayarak belirtmek gerekirse:

14. Otterlo Daireleri'nin üç versiyonu vardır. En bilineni ikinci versiyon olmasına rağmen van Eyck ilk versiyonu Otterlo Toplantısı'nda sunar (van Eyck, 1999, 13; Campos Uribe vd., 2020, 10).

gerçek üçüncü, geçici değil, gerçek kişiler arasında geçen her şeyin gerçek taşıyıcısıdır (bana kalırsa, yanlış alternatifler arasında uzlaşma yok, keyfi olarak bölünmüş bir ikiz fenomenin çatışan yaraları arasında keyfi bir köprü yok). Gerçek üçüncü yeni bir kaçamak değil çünkü bu yanlış alternatifler başarısız oldu. Her ne kadar Buber'in gerçek üçüncü kavramında ima edilse de bireycilik ve kolektivizmin soyutlamalar veya mutlaklar olarak uzlaştırmayacağını, çünkü yalnızca gerçek olanın el sıkışıp ikircikli anlam kazanabileceğini açıkça belirtmek isterim - gerçekten el sıkışmak için gerçek ellere ihtiyacı var. Gerçek üçüncü; gerçek bir diyalog, gerçek bir kucaklaşma, gerçek insanlar arasında geçen gerçek bir düellodur.

Buber; daha sonra - ve bu onun can alıcı noktasıdır -, gerçek üçüncünün, bir kişiye veya başka bir kişiye ayrı ayrı olan bir şey ve her şeyi içeren tarafsız bir dünya olmadığını; ama her ikisi arasında ve sadece her ikisinin de erişebileceği bir boyutta gerçekleşen bir şey olduğunu belirtir. Ara şekil alır. "Öznel olanın diğer tarafında, nesnel olanın bu tarafında, benim ve senin bulduğumuz dar sınırdaki ara alan ortaya çıkar." (van Eyck, 1962/2008, 54).

Van Eyck'e (1962/2008, 60) göre, bireycilik ve kolektivizm ikiz fenomeni için bir ara alan yaratmak mimarlığın görevidir. Onun Otterlo Daireleri (*Otterlo Circles*) bu argümana hizmet eder (14). Yunan tapınağı, Theo van Doesburg'un 1911 yılına ait çizimi ve bir Pueblo evine ait üç küçük görseli içeren ilk daire, klasik, modern ve arkaik geleneklerin uzlaştırılmasını önerir. Kutupların bir araya getirildiği ara alanın görsel bir tasviri olan bu daireyi van Eyck (1962/1999, 12-3) şu şekilde tasvir eder:

İlk daire içinde birleştirilen üç küçük resim ne gerçek bir çatışmayı gizler ne de özellikleri uyumsuzdur. Birbirlerini tamamlarlar, birbirlerine aittirler ve insan kişiliğinin eşit derecede geçerli yönlerini yansıtır. Eğer etkileşime girmelerine izin verilirse, eğer özellikleri bir araya getirilirse, sürekli değişen üç tür dar görüşlülüğün – sahte eklektizm, sahte bölgecilik ve sahte modernizm – cazibesine direnmek artık zor olmayacaktır.

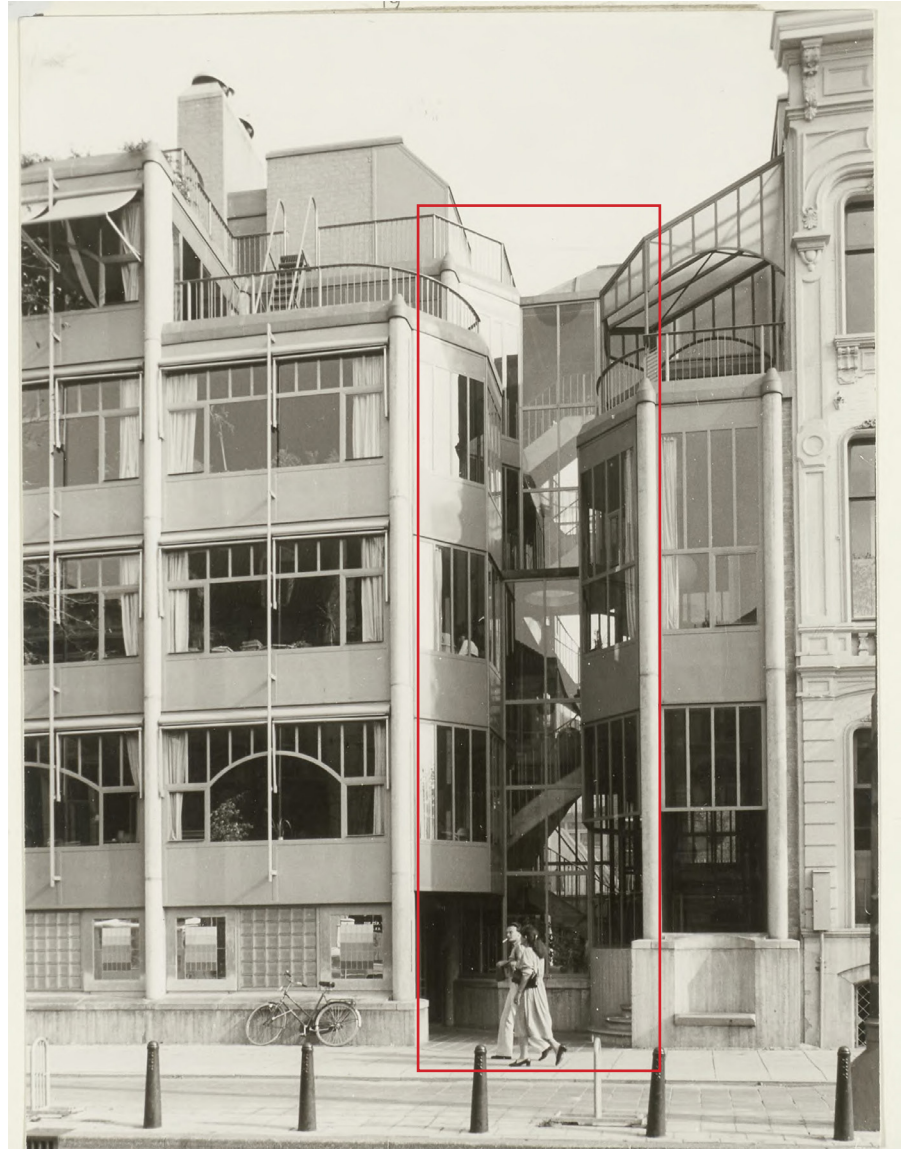
Van Eyck, mimarların kutuplar için bir ortak zemin sağlama görevinin altını çizmek için ilk çemberi bizim tarafımızdan (*par "nous"*, ikinci versiyonda ise *by "us"*) ifadesi ile ilişkilendirir: "Bu bizim işimiz: 'bizim' tarafımızdan bizim için" (van Eyck, 1962/1999, 13). Hem bireyci hem de kolektivist eğilimlere eleştirel yaklaşan ikinci daire (Clarke, 1985, 55), birey ile kolektif arasındaki ilişkiyi "Venezuela'daki Orinoco havzasından dans eden bir Kayapo Yerli Halkı" üzerinden tasvir eder (van Eyck, 2008, 468). Bizim için (*pour nous*, ikinci versiyonda da *for us*) terimi, "her insan ve tüm insanlar, birey ve toplum - dolayısıyla ikinci daire" (van Eyck, 1962/1999, 13) anlamına gelir.

Van Eyck; gerek Otterlo Daireleri'nde gerek çeşitli metinlerinde, ikiz fenomenler kavramını özetleyen nefes alma eylemine vurgu yapar. Van Eyck'e göre, eğer insanlar nefes alıp veriyorsa ve her zaman da öyle olacaksa mimarlık da aynı şeyi yapabilir. Ancak modern mimari zorlukla nefes almaktadır çünkü mimarlar ve planlamacılar bu insan doğasını - nefes alıp verme - inşa edilmiş forma yansıtmayı reddetmektedirler (van Eyck, 2008, 199-200, 337). Başka bir deyişle, mimarlar ve planlamacılar, ikiz fenomenleri, bu yaraların uzlaşmadıkları takdirde ikiz-negatifler (*twin-negatives*) olarak kalacaklarının farkına varmadan uyumsuz kutuplara ayırmaktadırlar (van Eyck, 2008, 335). Kutupların ayrımı, düzenin ayrıcalıklı olduğu ve kaosa ihtiyatla yaklaşıldığı düzen ve kaos örneğinde görülebilir; ama van Eyck'e göre kaosu üstesinden düzen yoluyla gelinebilir ve "kaos, ikiz kardeşi düzen kadar olumludur" (van Eyck, 2008, 335). Eğer kaos da en az düzen kadar olumlu olabiliyorsa zıt kutupların uzlaşabildiklerinde zararlı etkilerinin azaldığı ya da etkisiz hale

geldiği iddia edilebilir. Dolayısıyla, kutuplardan birini yok etmek yerine kutupların uzlaşmasına izin vermek gerekir.

Van Eyck; Otterlo Daireleri'nin ilk dairesinde altını çizdiği gibi, mimarların görevinin binaların nefes almasına yardımcı olmak ve kutupların birbirinden ayrılmasını önlemek olduğunu savunur. Bu durum ara alan aracılığıyla başarılabilir. Mimarların "inşa yoluyla bu ara-alanı sağlamaları, yani evden şehir ölçeğine kadar, gerçek insanlar ve gerçek şeyler için bir grup gerçek yer sağlamaları" gerekir (van Eyck, 1962/2008, 55).

Ara alan mimari açıdan pek çok biçim alabilir. Bunun en belirgin örneklerden birisi, içerisi ile dışarı arasında keskin bir sınır çizmeyen kapıdır. Kapı, aynı eylemle içeriye ve dışarıyı hem ayırarak hem de birbirine bağlayarak (Simmel, 1909/1994, 7) binanın nefes alıp vermesini sağlar. Van Eyck'e (1962/2008, 62) göre, bu mimari öge, giriş ve çıkışı çerçevelediği için sembolik bir değere de sahiptir. Van Eyck (1962/2008, 61-2; 2008, 318); giriş ve çıkışın, yani bir evden ayrılmanın ya da eve girmenin zor meseleler olduğunu, mimarının bu gerçekleri yok edemese de etkilerini



Resim 1. Hubertus Evi'nde eski ve yeni bina arasındaki döner merdiven ara alan örneğidir (Stadsarchief Amsterdam, arşiv kayıt no: AANA0123500001).

şiddetlendirmek yerine yatıştırarak onlara dayanma gücü verebileceğini ifade eder. Bir ara alan olarak kapı bu görevi üstlenebilir ve kişinin oyalanmasına izin verebilir (van Eyck, 1962/2008, 69).

Benzer bir şekilde eşik de sadece içerisi ve dışarıyı arasında değil, aynı zamanda ev ve şehir, özel ve kamusal, parça ve bütün, güvenli ve özgür, tek ve çok arasında bir diyalog kuran bir ara alandır. Van Eyck'e (2008, 126) göre, "konut ve onun dışı doğru uzantısı, şehir ve onun içi doğru uzantısını" yaratmak mimarların görevidir. Böyle bir ilişki van Eyck'in yapılarında gözlemlenebilir. Van Eyck, dışarının içeriye nüfuz etmesine izin vererek binalarına genellikle giriş ve çıkışın bir deneyim haline gelmesini sağlayan gecikmeli bir giriş sağlar (Strauven, 1994/1998, 461). Bu gecikmeli giriş birçok şekilde olabilir: Hubertus Evi'nde eski ve yeni bina arasında döner merdivendir (**Resim 1**); Schmela Evi ve Galerisi'nde sergi alanına bakan camlı bir silindirdir; Amsterdam Yetimhanesi'nde ise bu gecikmeli giriş doğrudan iç avluya uzanır (**Resim 13, Resim 14**) (Strauven, 1994/1998, 461).

DAHİL OLMAK, EVDE OLMAK

Van Eyck'e (1962/2008, 48) göre, modern mimari insanları dışlayan soyut ve kapalı mekân ve zaman kavramlarına sahiptir. "Mimarlığın öznesi ve nesnesi" olan insanı dahil etmek, "eve dönüşüne yardımcı olmak" için mekân ve zaman kavramları açılmalı ya da van Eyck'in ifadesiyle içselleştirilmelidir (van Eyck, 1962/2008, 50). Van Eyck için önemli olan mekân değil, "mekânın içi ve bu iç ufkudur," dolayısıyla "mekân ve zamanın 'açılması' - içselleştirilmesi - gerekir ki içine girilebilsin: insanı kendi anlamlarına katmak - içermek - için ikna edilebilsin" (van Eyck, 2008, 472).

İnsanın dahil edilmesi insan deneyimlerinin dahil edilmesi anlamına gelir. Van Eyck'e göre; herhangi bir mekân ne kadar nötr olursa olsun belirli bir olayın sonucunda bireysel ya da kolektif bir anlam kazanabilir. İçsel nitelikleri ne olursa olsun herhangi bir mekâna ya da öğeye kişisel deneyim yoluyla "yoğunlaştırılmış anlam" verilebilir ve bu anlam da bu mekânların özel olarak tanınmasına yol açar (van Eyck, 1962/2008, 81). Mekân; "olmanın iyi olduğu bir yer olarak" görüldüğünde insanlar da mekâna dâhil edilebilir ve böylece mekân insanların imgesinde yer olarak adlandırılabilir (van Eyck, 2008, 296). Başka bir deyişle, mekân insanları içinde yaşamasına izin verdiğinde yer haline gelir (van Eyck, 1962/2008, 67).

Bir yapının, formun ya da malzemenin "şiirsel ve sihirli bir eylem" aracılığıyla yer olmasına imkân verildiğinde orayı deneyimleyebilen insanlar da orada yaşadıklarının farkında olurlar (van Eyck, 1962/2008, 67). Üstelik bu şiirsel ve sihirli eylemin görkemli bir şey olması da gerekmez. Van Eyck'in Amsterdam'daki dairesindeki çelik halka gibi çok küçük bir dokunuş da olabilir. Van Eyck (1999, 54); 1948 yılında tasarladığı bu çelik halkayı, mekânı yere dönüştürmeye yönelik ilk girişimi olarak görür. Benzer bir şekilde, "üzerinde dinlenmek, konuşmak, beklemek ya da izlemek için bir duvar, bir koltuk ya da birkaç basamak; insanların bir vesileyle etrafında toplandığı bir masa, yaslanıp pipo içilebilecek bir korkuluk, duvar ya da elektrik direği; insanın oyalanmasını sağlayan bir kapı" (van Eyck, 1962/2008, 69), mekân niteliği taşımadığı halde insanlarla kurulan ilişkiden ötürü yer olarak görülür (**Resim 2**).

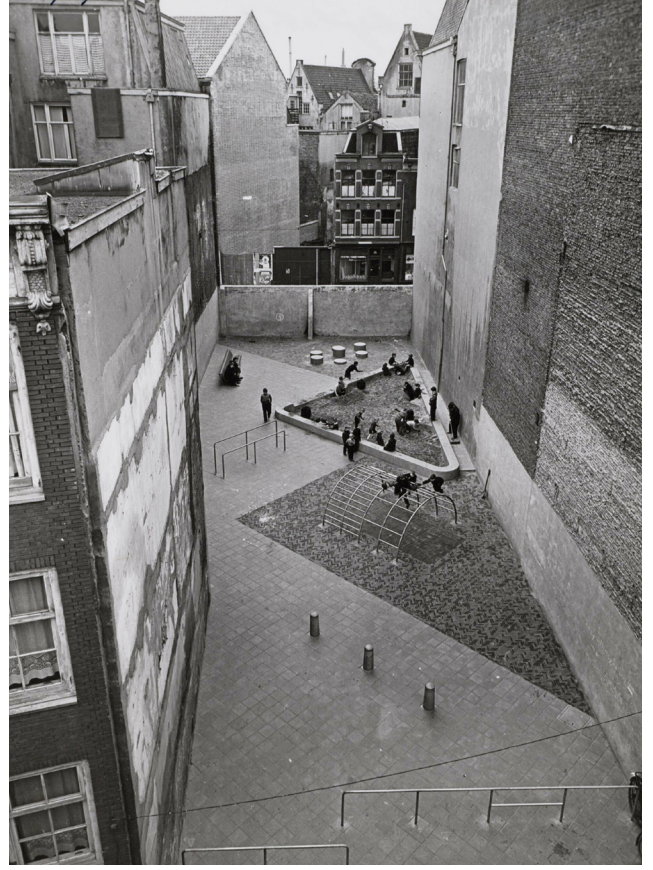
Resim 2. Van Eyck ile Jan Rietveld'in yaşlılar için tasarladıkları evlerin (*The Houses for the Elderly*) önlerindeki trabzanlar yer örneği teşkil eder (Stadsarchief Amsterdam, arşiv kayıt no: 5293FO006211).



Van Eyck'in mimari düşüncesinde; insanın mekândaki varlığı, deneyimi ve etkinliği mekânı yere dönüştürür. Dolayısıyla insanın deneyimi esastır ve insanın katılımı değerli kabul edilir. Burada belirtmek gerekir ki mekân ve yer arasındaki ayırım 1960'ların başında yaygın değildir; ancak "van Eyck bunları altmışlı yılların ortalarında geliştirdikten kısa bir süre sonra mimari düşüncenin ticari sermayesinin bir parçası haline gelmiştir" (Strauven, 1998, 471).

Yerin insan deneyimini dahil eden tanımı göz önünde bulundurulduğunda zaman da işin içine girmelidir. Bunun bilincinde olan van Eyck, Henri Bergson'un süre (*durée*) kavramından yararlanır (Strauven, 1994/1998, 419). Süre; geçmiş, şimdi ve geleceğin yoğunlaştığı ve bir süreklilik oluşturduğu içselleştirilmiş psikolojik zamanı ifade eder (Campos Uribe vd., 2020, 5). Zamanın doğrusal bir kavram olduğuna dair yaygın inanışın aksine süre bazen büyük ve kapsayıcı bazen de küçük ve dışlayıcı olarak değerlendirilebilir (van Eyck, 1962/2008, 74). Zamanın bu göreliliği deneyime bağlıdır. Van Eyck'in de belirttiği gibi, insanlar, deneyimlerine tam olarak dahil olduklarında sürenin yani zamansal derinliğin farkına varırlar. Zamansal derinlik hafıza ve beklenti aracılığıyla işlendiğinde şeffaf ve yoğun bir hal alır (van Eyck, 1962/2008, 74). Böylelikle, hem geçmiş hem geleceği kuşatan şimdi geçmiş ve geleceğin ikiz fenomeni için bir ara alan haline gelir. Geçmiş ve gelecek, şimdiki zamana dahil edildiğinde insan da zamana dahil olmuş olur. Şimdiki zaman "jilet gibi keskinliğini" kaybederek "içselleştirilmiş zaman" olarak genişler yahut şeffaflaşır (van Eyck, 2008, 474). Zamana dahil olmak insanı evinde hissettirir. Dolayısıyla insanın kendini evinde hissedebilmesi için mekânın da süreyi içermesi gerekir. Bu konuda van Eyck şöyle söyler:

[...] insan süreyi deneyimlediği anda kendini zamanın içinde - dahil - ve zamanı da onun içinde hisseder. Zamanla çakışırken, dahası, kendisiyle de çakışır. O halde süre duygusu ile varlık duygusu arasında, hatta bunlar ile şimdiki zaman duygusu arasında hiçbir fark yoktur, çünkü şimdiki zaman geçmişe ve geleceğe doğru uzanarak deneyimlenir; geçmiş ve gelecek şimdiki zamanda yaratılır. Bu da kendini gerçekleştirme anlamına gelir. Evet, insan süre içinde 'evindedir'. Ancak 'kapalı zamanda' insana yer yoktur. Ardışık anın soyutlanmasında, insan, boyut duygusunu ve dolayısıyla kimliğini de kaybeder. (van Eyck, 1962/2008, 74)



Resim 3, Resim 4. Dijkstraat oyun alanı, öncesi ve sonrası (Stadsarchief Amsterdam, arşiv kayıt no: 10009003408; 010009003409).

Resim 5, Resim 6. Van Hogendorpplein oyun alanı, öncesi ve sonrası (Stadsarchief Amsterdam, arşiv kayıt no: 010009010387; 010009010388).

Van Eyck, içselleştirilmiş mekân ve zamanın “inşa edilmiş eve dönüşü” (*built-homecoming*) oluşturma potansiyeline sahip olduğuna inanır (Clarke, 1985, 115, 121). Van Eyck'e göre (1962/2008, 61-2), insan hangi yöne giderse gitsin hem ev hem de şehir eve gidiyormuş hissi vermelidir. Dış dünyada kendini evinde hissetmek pek de kolay olmayabilir ama van Eyck özellikle buna vurgu yapar ve planlamacıların görevinin “inşa edilmiş eve dönüş” sağlamak, aidiyet duygusunu sürdürmek ve böylece herkes için yer oluşturmak olduğunu ifade eder (van Eyck, 2008, 318-9).

Amsterdam'ın dört bir yanındaki oyun alanları, inşa edilmiş eve dönüşün ve herkes için yer sağlamanın somut örnekleri olarak kabul edilebilir. Van





Resim 7, Resim 8. Transvaalplein oyun alanı, öncesi ve sonrası (Stadsarchief Amsterdam, arşiv kayıt no: OSIM00004001723; 010009009658).

Eyck; 1947 ile 1970 yılları arasında, hemen her mahalledeki boş arazilere yahut unutulmuş alanlara, boş yer olmayan mahallelerde ise İkinci Dünya Savaşı sırasında tehcir edilen insanların evleri yıkılınca boşalan arsalar ve artık alanlara 700'den fazla oyun alanı tasarlar (van Eyck, 1999, 68, 70) (**Resim 3 - Resim 8**). Bu oyun alanlarını tasarlarken, bir katalogdan alüminyum fil veya zürafa gibi oyun alanı ekipmanlarını seçmek yerine çocukların üzerine veya altına oturabileceği ve çeşitli biçimlerde kullanabileceği kubbe, iglo veya kemer gibi şekilleri kullanır (van Eyck, 2008, 115). Çocuklara bu tür ekipmanları deneyimleme fırsatı yaratarak çocukların eylemleri aracılığıyla mekâna katılım sağlamalarını ve mekanı yere dönüştürmelerini sağlar. Oyun alanları sadece çocuklar tarafından değil aynı zamanda gençler ve yetişkinler tarafından da kullanılabilirdiği için farklı yaş grubundan insanları bir araya getirerek kutuplara bir zemin sağlayan ve herkes için yer sağlayan ara alan olarak görev yaparlar.

BÜYÜK EV VE KÜÇÜK ŞEHİR

Van Eyck, ikiz fenomenlerin kutuplarının ayrılmasına bir son verilmesinin gerekliliği üzerinde durur. Bu durum mimarlık ve şehircilik ikiz fenomeni için de geçerlidir. "Bir ev, gerçek bir ev olacaksa küçük bir şehir gibidir; bir şehir de gerçek bir şehir olacaksa büyük bir ev gibidir" diye ifade eden van Eyck'e (1962/2008, 10, 60) göre, büyük ev ve küçük şehir bir ara alan imgesi oluşturur (van Eyck, 2008, 425).

Büyük ev ve küçük şehir ilişkisi doğru boyut (*right-size*) ile ilgilidir zira küçük olmadan büyük olan doğru boyuta sahip değildir ve doğru boyut olmadan insan boyutu da olmaz (van Eyck, 1962/2008, 60). Doğru boyut; aynı zamanda, az ve çok, yakın ve uzak, basit ve karmaşık, açık ve kapalı, birlik ve çeşitlilik ve pek tabii parça ve bütün gibi ikiz fenomenleri de içinde barındırır (van Eyck, 2008, 327) ve bunların hepsi büyük ev ve küçük şehirden doğar (Ligtelijn ve Strauven, 2008, 10). Dolayısıyla, tüm bu ikiz fenomenleri içeren "büyük ev-küçük şehir imgesi, çok anlamlılık için alan sağlar" (van Eyck, 1962/2008, 90). Van Eyck, büyük ev ve küçük şehir arasındaki bu ilişki ile parça-bütün ilişkisini ağaç ve yaprak arasındaki ilişkiye gönderme yaparak da ifade eder:

Ağaç yapraktır ve yaprak ağaçtır.

Şehir evdir ve ev de şehirdir.

Herhangi bir 'parçayı' alın ve orada 'bütün' vardır.

'Bütünü alın ve 'parçayı görün.

Her biri ev ya da ağaç, şehir ya da yaprak olmak için ihtiyaç duyduğu şeylerle - nem, hava, özsü, insanlar ve insanların faaliyetleri, duyguları ve çağrışımları - tanımlandığı sürece bütün parçadır ve parça bütündür. (van Eyck, 2008, 428)

Van Eyck'in yaprak ve ağaç metaforundan yola çıkarak, bir meşe ağacının birbirinden farklı boyut ve şekillerde yaprakları ve bu yaprakların kendilerine ait kimlikleri olsa da her birinin meşe ağacının yaprağı olduğunu fark etmenin ve onları söğüt ağacının yapraklarından ayırt edebilmenin mümkün olduğu söylenebilir. Van Eyck'e göre şehir de tam olarak bu şekilde oluşturulmalıdır. Her bina kendi kimliğine sahip olsa da binalar bir araya geldiklerinde anlamlı bir bütün oluşturabilmelidir.

Ev ve şehir arasındaki bu ilişkinin izinin Leon Battista Alberti ve Andrea Palladio'ya kadar sürülebileceğini belirtmek gerekir (van Eyck, 1962/2008, 228). Alberti, *De re Aedificatoria*'da "Filozofların iddia ettiği gibi, şehir büyük bir evse ve ev de küçük bir şehre benziyorsa, evin çeşitli bölümleri küçük konutlar olarak kabul edilemez mi?" diye sorar (van Eyck, 1962/2008, 228-9). Benzer bir şekilde, bir yüzyıl sonra, Palladio (1570/2001, 46) "şehir büyük bir evden daha fazla veya daha az bir şey değildir ve tersine, ev küçük bir şehirdir" der. Francis Strauven'e (1994/1998, 300) göre van Eyck, Alberti ve Palladio'nun ev ve şehir ilişkilerinden haberdar değildir; bu ilişkiyi Amsterdam Yetimhanesi'ni tasarlarken kendi kendine yeniden keşfeder.

Kuşkusuz, Amsterdam Yetimhanesi, "çocukların büyük evi-küçük şehridir" (van Eyck, 2008, 318). Van Eyck'in başyapıtı olarak kabul edilebilecek Amsterdam Yetimhanesi (1955-60) korumasız çocuklar için bir yuva olarak inşa edilmiştir: "Büyük bir dünyada küçük bir dünya, küçük bir dünyada büyük bir dünya, bir şehir gibi bir ev, bir ev gibi bir şehir; çocuklar için bir yuva, hayatta kalmaktan ziyade yaşayabilecekleri bir yer - en azından ben öyle olmasını amaçladım" (van Eyck, 1962/2008, 222) (**Resim 9 - Resim 15**). Bu küçük bir dünyada büyük dünya korumasız çocukları barındırmakla kalmaz aynı zamanda bireysel ve kolektif, ev ve şehir, küçük ve büyük, içerisi ve dışarı, çağdaş ve geleneksel gibi pek çok ikiz fenomenleri barındırır. İkiz fenomenlerin etkileşimi; hem özerk bir yer olarak düşünülebilen hem de ara alanlar aracılığıyla karşılıklı olarak ilişkili olan çeşitli yerlerin hiyerarşik olmayan bir dokusunun planını üretir (Strauven, 1994/1998, 300).

Van Eyck, yetimhaneyi geniş bir açık meydan aracılığıyla sokağa bağlar (**Resim 13, Resim 14**). Bir evden çıkmanın ve eve girmenin zor bir mesele olduğu gerçeğini akılda tutarak, bu açık meydanı nazikçe yol gösteren ve böylece dışarıdaki ve yetimhanedeki gerçeklik arasındaki ani geçişi hafifletmeye yardımcı olabilecek bir ara alan olarak tasarlar (van Eyck, 2008, 318). Kamusal alanın bir devamı olarak düşünülen açık meydan mahalle çocuklarını yetimhane çocuklarıyla etkileşime davet eder gibidir (Strauven, 1994/1998, 289); böylelikle, çocuklar için bir toplanma yeri işlevi de görür.

Yetimhane müdürü Frans van Meurs'un da isteği üzerine yetimhanenin boyutları çocukların boylarına göre ayarlanır. Van Eyck bunu tavanı alçaltarak değil küçük ve büyük ikiz fenomeni elde etmek için büyük kubbeli alanların altına küçük oyun alanlarını gömerek, küçük ve büyük için aynı anda bulunma fırsatı yaratarak başarır (Strauven, 1994/1998, 297). Yetimhanenin farklı bölümlerini birbirine bağlayan koridorlar da yine ara alan örneğidir. Bu koridorlar - iç sokaklar - çocukların kendilerini herhangi bir sokakta gibi hissetmelerini sağlamak amacıyla dışarıda kullanılan



Resim 9, Resim 10, Resim 11, Resim 12.
Amsterdam Yetimhanesi (Stadsarchief
Amsterdam, arşiv kayıt no: 10028000864;
5293FO016347; 10028000866; 10122005124).

malzemelerle ve sokak aydınlatmasıyla üzerinde çatısı olan bir sokak olarak tasarlanır (van Eyck, 1962/1999, 89).

Yetimhanedeki bu ara alan örneklerine ek olarak, tıpkı Otterlo Daireleri'nin ilk dairesinde gösterildiği gibi, yetimhanede de klasik, modern ve arkaik geleneklerin uzlaştırılması gözlemlenir. Strauven (2007, 6-7) bu uzlaşmayı şu şekilde açıklamaktadır:

Klasik gelenek, planın temelinde yer alan düzenli geometrik düzende bulunur. Modern olan, klasik düzeni aşan dinamik merkezkaç boşlukta kendini gösterir. Arkaik gelenek, binanın resmi görünümünün çeşitli yönlerinde kendini gösterir. Tüm binayı kaplayan yumuşak, biyomorfik kubbeler nedeniyle (**Resim 15**), uyandırdığı ilk izlenim, küçük bir Arap kubbeli şehri veya bir Afrika köyünü anımsatan arkaik bir yerleşim yeridir.

Yetimhanenin bahsedilenler gibi pek çok zıt kutup için ara alan sağlaması özellikle önemlidir. Öyle ki "iç içe geçmiş ikiz fenomenler ne kadar fazlaysa zihin orada kendini o kadar çok evinde hisseder" (Strauven, 1994/1998, 370).

SONUÇ

Bu metin, İkinci Dünya Savaşı sonrasında ortaya çıkan ve şeyler arasındaki ilişkiyi vurgulayan çeşitli yaklaşımlar arasından ara alan kavramına odaklanmıştır. Van Eyck'in, özellikle Martin Buber'in felsefesinden esinlenerek geliştirdiği bu kavram çatışan karşıtların buluşabileceği, ilişki



Resim 13, Resim 14. Amsterdam Yetimhanesi açık meydanı ara alan olarak tasarlanmıştır (Stadsarchief Amsterdam, arşiv kayıt no: 010122005118; 10122005119).

kurabileceği, uzlaşabileceği ve ikiz fenomen haline gelebileceği ortak bir zemin sağlar.

Her ne kadar ara alan kavramı güncel tartışmalarda ara mekân (*in-between space*) olarak adlandırılıp genellikle kamusal ile özel ya da içerisi ile dışarısı arasındaki alanı tanımlamak için kullanılıyor olsa da van Eyck'in geliştirdiği ara alan bu tanımlarla sınırlı kalmaz ve küçük ve büyük, kamusal ve özel, içerisi ve dışarısı, parça ve bütün, bireysel ve kolektif, klasik ve modern, geçmiş ve gelecek gibi pek çok karşıtlığı uzlaştırarak çoklu anlam sunar.

Van Eyck'in geliştirdiği ara alan kavramının gözden geçirilmesinden ortaya çıkan en önemli bulgulardan birisi, ara alanın, yalnızca insanlar arasında



Resim 15. Amsterdam Yetimhanesi'nin kubbeleri (Stadsarchief Amsterdam, arşiv kayıt no: 10122005114).

bir ilişki önermeyip aynı zamanda insan ile yer, yapı ile yapı, yapının farklı nitelikleri ve farklı zaman dilimleri arasında da ilişki önermesidir. Tüm bu ilişki biçimleri göz önüne alındığında ara alanı sadece sosyal mekân olarak ifade etmek ara alanın kapsamını daraltmaktadır.

Bununla bağlantılı olarak bu metnin bir diğer bulgusu da ara alanın çatışan karşıtlardan birini diğerine tercih etmeyip kutuplar için denge sağlamasıdır. Özellikle birey ve kolektif ikiz fenomeni düşünüldüğünde bu denge oldukça önemlidir. Bu iki zıtlık arasındaki denge olmadığında, günümüzde olduğu gibi, toplumun birey üzerindeki örtük baskısı bireyin kendisini anormal hissetmesine ve sosyalleşmek zorunda kalmasına neden olur. Yine bu denge sağlanmadığında, insanlar zoraki olarak bir araya gelirler ve yapay ilişkiler kurarlar. Bu denge ise insanların başkalarıyla etkileşimde bulunma veya tek başına kalma konusunda özgür olduklarını vurgular. Özgür irade ile yapıldığında her iki durum da sahici ilişkiler oluşturabilir. Her ne kadar tek başınalık çoğunlukla yalnızlık ile ilişkilendirilse de kişi tek başınayken kendisiyle ve/ya çevresiyle ilişki kurabilir. Dolayısıyla, ara alan, insanları sosyalleşmeye zorlamaz aksine insanlara olanaklardan en uygun olanı seçmesini önerir. Her iki koşul için de seçenekler sunan van Eyck'in yapıtlarında birey ve kolektif arasındaki dengenin gerçekleşmesinde bir değer görülmektedir.

Bu metin, ara alanın önerdiği çoklu anlamdan yola çıkarak ilişki biçimlerinin kişilerarası olanın ötesine genişletilebileceği sonucunu çıkarır. Uygun koşullar yaratıldığında insanların çevreleriyle ilişki kurmaları buna bir örnek teşkil eder. Van Eyck'in de vurguladığı gibi bu ilişki mekânı yere dönüştürür. İnsan ve yer arasındaki bu ilişki insan olmadan yerin anlamının eksik kalacağını ifade eder.

KAYNAKLAR

- AELBRECHT, P.S. (2016) 'Fourth Places': The Contemporary Public Settings Settings for Informal Social Interaction Among Strangers, *Journal of Urban Design* 21(1) 124-52.
- AVERMAETE, T. (2016) The Socius of Modern Architecture: Spatializing the Social and Socializing the Spatial in CIAM and Team 10, *Small Interventions: New Ways of Living in Post-war Modernism*, ed. W. Nägele ve N. Tajeri, Birkhäuser, Basel; 25-32.
- AZHAR, J., GJERDE, M. (2016) Re-thinking the Role of Urban In-between Spaces, *Fifty Years Later: Revisiting the Role of Architectural Science in Design and Practice: 50th International Conference of the Architectural Science Association*, ed. J. Zuo, L. Daniel, V. Soebarto, The Architectural Science Association ve The University of Adelaide, Adelaide; 1-10.
- BENJAMIN, W., LACIS, A. (1924) Naples, *One-Way Street and Other Essays* Walter Benjamin, çev. Edmund Jephcott ve Kingsley Shorter ([1979] 2006) Verso, Londra; New York; 167-76.
- BROSIUS, C., SCHILBACH, T. (2016) "Mind the Gap": Thinking about In-between Spaces in Delhi and Shanghai, *City, Culture and Society* 7(4) 1-6.
- BUBER, M. (1923) *I and Thou*, çev. W. Kaufmann (1970) Charles Scribner's Sons, New York.

- BUBER, M. (1947) *Between Man and Man*, çev. R. Gregor-Smith (2004) Routledge, Londra; New York.
- CAMPOS URIBE, A., MARTÍNEZ VENTURA, J., LACOMBA, P. (2020) Multiculturalism in Post-War Architecture: Aldo van Eyck and the Otterlo Circles. *ACE Architecture, City and Environment* 14(42) 1-23.
- CAN, I. (2012) *In-Between Space and Social Interaction: A Case Study of Three Neighbourhoods in Izmir*, Doktora tezi, Nottingham Üniversitesi, Nottingham.
- CAN, I., HEATH, T. (2015) "Syntax, In-Between Spaces and Social Interaction: A Morphological Analysis of İzmir Using Space." *Journal of Housing and the Built Environment* 31(1) 31-49.
- CANLI, M. (2019) William Blake's "Songs of Innocence and Experience" as a Practice and Manifestation of the English Romantic Movement. *Eurasian Journal of English Language and Literature* 1(1) 15-22.
- CLARKE, P. D. (1985) *The Writings of Aldo van Eyck: A Modernist Sensibility Introduced into Architecture*, Doktora Tezi, Bristol Üniversitesi, Bristol.
- COLEMAN, N. (2005) *Utopias and Architecture*, Routledge, New York.
- FRAMPTON, K. ([1980] 1982) *Modern Architecture: A Critical History*, Thames and Hudson, Londra.
- FRIEDMAN, M. (1955) Healing Through Meeting: Martin Buber and Psychotherapy, *CrossCurrents* 5(4) 297-310.
- FRIEDMAN, M. (1999) The Interhuman and What is Common to All: Martin Buber and Sociology, *Journal for the Theory of Social Behaviour* 29(4) 403-17.
- FRIEDMAN, M. (2004) Introduction, *Between Man and Man*, M. Buber, çev. R. Gregor-Smith. Routledge, Londra; New York; xi-xx.
- GEHL, J. (1971) *Life Between Buildings: Using Public Space*, çev. Jo Kotch (2011) Island Press, Washington.
- GEHL, J. (2010) *Cities for People*, Island Press, Vaşington; Londra.
- GIEDION, S. (1958) *Architecture, You, and Me: The Diary of a Development* Harvard University Press, Cambridge.
- HAJER, M., REIJNDORP, A. (2002) *In Search of New Public Domain: Analysis and Strategy*, NAI Publishers, Rotterdam.
- HEGEL, G.W. (1812-1816) *The Science of Logic*, ed., çev. G. D. Giovanni (2010) Cambridge University Press, Cambridge.
- HENKET, H.J. (2018) The In-Between Realm; Some memories of Aldo van Eyck and other Team 10 members in the 60's, *15th International DOCOMOMO Conference: Metamorphosis. The Continuity of Change*, ed. A. Tostões ve N. Koselj, Docomomo International, Ljubljana; 55-61.
- HERTZBERGER, H. (1991) *Lessons for Students in Architecture*, çev. Ina Rike (2001) 010 Publishers, Rotterdam.
- JASCHKE, K. (2012) *Mythical Journeys: Ethnography, Archaeology, and the Attraction of Tribal Cultures in the Work of Aldo van Eyck and Herman Haan*, Doktora Tezi, Princeton Üniversitesi, Princeton.
- LIGTELIJN, V. (1999) Introduction to the Work of Aldo van Eyck, *Aldo van*

- Eyck, works*, A. v. Eyck, ed. V. Ligtelijn, çev. G. Ball, Birkhäuser Publishers, Basel; Boston; Berlin; 14-9.
- LIGTELIJN, V., STRAUVEN, F. (2008) Introduction, *The Child, The City and the Artist: An essay on architecture: The in-between realm*, A. v. Eyck, ed. V. Ligtelijn, F. Strauven, SUN Publishers, Amsterdam; 6-13.
- LOUKAITOU-SIDERIS, A. (1996) Cracks in the City: Addressing the Constraints and Potentials of Urban Design, *Journal of Urban Design* 1(1) 91-103.
- MADANIPOUR, A. (2003) *Public and Private Spaces of the City*, Routledge, Londra; New York.
- MOSELEY, A. J. (2015) *A Theology of Interconnectivity: Buber, Dialogue and Cyberspace*, Doktora Tezi, Kent Üniversitesi, Canterbury.
- NOORADDIN, H. (1996) *Al-Fina', A Study of "In between" Spaces along Streets as an Urban Design Concept in Islamic Cities of the Middle East with a Case Study in Cairo*, Doktora Tezi, Norveç Bilim ve Teknoloji Üniversitesi, Trondheim.
- NOORADDIN, H. (1998) Al-fina', In-between Spaces as an Urban Design Concept: Making Public and Private Places along Streets in Islamic Cities of the Middle East, *URBAN DESIGN International* 3(1-2) 65-77.
- ÖZER, T. (2022) *From Relationlessness to Relatedness: Alienation and the In-Between Realm Revisited*, Doktora Tezi, Orta Doğu Teknik Üniversitesi, Ankara.
- PALLADIO, A. ([1570] 2001) *The Four Books on Architecture*, çev. Robert Tavernar & Richard Schofield, The MIT Press, Cambridge.
- REMBEZA, M., SAS-BOJARSKA, A. (2022) The Changing Nature of In-Between Spaces in the Transformation Process of Cities, *Urban Planning* 7(1) 32-43.
- RISSELADA, M., VAN DEN HEUVEL, D., ed. (2005) *Team 10: In Search of a Utopia of the Present 1953-1981*, NAI Publishers, Rotterdam.
- SACK, O. (2019) *The Socio-Spatial Aesthetics of Space Formation: A New Perspective on the Concepts and Architecture of Walter Gropius and Aldo van Eyck*, Doktora Tezi, Delft Teknik Üniversitesi, Delft.
- SENNETT, R. (2017) Open City: Lecture by sociologist Richard Sennett, *Radboud Reflects*. [<https://www.ru.nl/radboudreflects/terugblik/grotesprekers-great-thinkers/17-06-14-open-city-lecture-by-sociologist-richard/>] Erişim Tarihi (10.08.2022).
- SENNETT, R. ([2018] 2019) *Building and Dwelling: Ethics for the City*, Penguin Books, Londra.
- SIMMEL, G. (1994) Bridge and Door (1909). *Theory, Culture & Society* (11) 5-10.
- SMITHSON, A., ed. (1968) *Team 10 Primer*, The MIT Press, Cambridge.
- STADSARCHIEF AMSTERDAM. *Gemeente Amsterdam Stadsarchief*. [<https://archieff.amsterdam/uitleg>] Erişim Tarihi (13.02.2023).
- STRAUVEN, F. ([1994] 1998) *Aldo van Eyck: The Shape of the Relativity*, Architectura & Natura, Amsterdam.

- STRAUVEN, F. (2002) Aldo van Eyck. Modern Architecture and Dogon Culture. *Lotus International* 114(Eylül) 120-131.
- STRAUVEN, F. (2007) Aldo van Eyck – Shaping the New Reality From the In-between to the Aesthetics of Number, *CCA Mellon Lectures*. [<https://www.cca.qc.ca/cca.media/files/1491/1392/Mellon12-FS.pdf>] Erişim Tarihi (28.03.2021).
- TEAM 10 ONLINE. [<http://www.team10online.org/index.html>] Erişim Tarihi (17.11.2020).
- TEYSSOT, G. (2011) Aldo Van Eyck and the Rise of an Ethnographic Paradigm in the 1960s. *Joelho* (2) 50-67.
- VAN DEN HEUVEL, D., MARTENS, J., MUÑOZ SANZ, V., ed. (2021) *Habitat: Ecology Thinking in Architecture*. nai010 publishers, Rotterdam.
- VAN EYCK, A. (1999) *Aldo van Eyck, works*, ed. V. Ligtelijn, çev. G. Ball, Birkhäuser Publishers, Basel.
- VAN EYCK, A. (2008) The Child, the City and the Artist: An Essay on Architecture, the in-between realm (1962), ed. V. Ligtelijn, F. Strauven, SUN Publishers, Amsterdam.
- VAN EYCK, A. (2008) *Collected Articles and Other Writings 1947-1998*, ed. V. Ligtelijn, F. Strauven, SUN Publishers, Amsterdam.
- VINK, F. (2021) *An Investigation into the Development of the Spatial Concept of the In-Between Space in the Netherlands and Japan in the 20th Century*, Yüksek Lisans Tezi, Delft Teknik Üniversitesi, Delft.
- YALGIN, Y.V. (2016) *Mimarlıkta Programın Çözünmesi: Ara Mekânlar*, Yüksek Lisans Tezi, İstanbul Teknik Üniversitesi, İstanbul.

Received: 19.08.2021; Final Text: 07.03.2023

Keywords: Aldo van Eyck; in-between; in-between realm; Martin Buber.

REVISITING ALDO VAN EYCK'S CONCEPT OF THE IN-BETWEEN REALM

After the Second World War, approaches are developed to rehumanize urban life and to establish relationships between things. This issue of establishing relationships between things, which comes to the fore with the first post-war CIAM meeting in Bridgwater in 1947, remains relevant in the subsequent CIAM meetings and later in Team 10's approaches.

This text argues that the relationship between things is handled comprehensively with the concept of the in-between realm developed by Aldo van Eyck. Inspired by Martin Buber's concept of the realm of the in-between and the leading avant-garde sources of the period, van Eyck develops the concept of the in-between realm, which provides a common ground for conflicting opposites to meet, interact and reconcile, and offers various forms of relationship. Drawing on the writings of van Eyck and Buber and related studies, the text touches on Buber's concept, deals with van Eyck's interpretation of this concept, and aims to reveal the multi-meaning of van Eyck's concept of the in-between realm.

ALDO VAN EYCK'İN ARA ALAN KAVRAMININ GÖZDEN GEÇİRİLMESİ

İkinci Dünya Savaşı sonrasında, kent yaşamını yeniden insanlaştırmaya ve şeyler arasında ilişki kurmaya yönelik yaklaşımlar geliştirilir. 1947'de Bridgwater'da yapılan savaş sonrası ilk CIAM toplantısıyla gündeme gelen ilişkilendirme meselesi, ilerleyen CIAM toplantılarında ve sonrasında da Team 10'in yaklaşımlarında güncelliğini sürdürür.

Bu metin, şeyler arasındaki ilişkinin, Aldo van Eyck'in geliştirdiği ara alan kavramıyla kapsamlı olarak ele alındığını iddia eder. Martin Buber'in ara alan kavramından ve dönemin önde gelen avangart kaynaklarından esinlenen van Eyck, çatışan zıtlıkların buluşması, etkileşime girmesi ve uzlaşması için ortak bir zemin sağlayan ve çeşitli ilişki biçimleri sunan ara alan kavramını geliştirir. Van Eyck ile Buber'in metinlerinden ve ilgili araştırmalardan yararlanan bu metin, Buber'in ara alan kavramına değinir, van Eyck'in bu kavramı yorumlayış biçimini ele alır ve van Eyck'in geliştirdiği ara alan kavramının çok anlamlılığını ortaya çıkarmayı amaçlar.

TUĞBA ÖZER; B.Arch., M.Arch., PhD.

Received her B.Arch. degree in 2014 and M.Arch. degree in 2016 from Middle East Technical University. Received her PhD in Architecture from Middle East Technical University in 2022. Her research interests include intersections of architecture, alienation, and everyday life. tugbaozer01@gmail.com

REFLECTION OF EMPATHIC DESIGN PROCESS ON INTERIOR ARCHITECTURE STUDENTS' UNIVERSAL DESIGN SOLUTIONS (1)

Melis YEŞİLTEPE*, Halime DEMİRKAN**

Received: 06.04.2022; Final Text: 26.01.2023

Keywords: design education; design process; empathic design; human factors; universal design.

1. This research was conducted as a part of the PhD. thesis of the first author in Bilkent University, in the Department of Interior Architecture and Environmental Design.

INTRODUCTION

In design education, applying universal design (UD) and human factors/ergonomics (HF/E) principles can be a complicated task in practice for students who must apply these principles in their designs. Designing products and architectural spaces according to the UD principles make products and environments usable to the greatest extent by people with diverse abilities. The important thing is that the student designers should involve people with disabilities with an increased awareness and without any discrimination and stigmatization of users in their designs. This could be achieved by gaining empathy toward people with disabilities' as well as their needs, problems, and expectations from the environment or products in design studio process. In this respect, the purpose of this study is to explore the empathic design (ED) approach as a design learning and experiential tool in interior architecture education regarding the pedagogical outcomes and process assessment of ED. So, the main aim of this study is to investigate the role of three ED techniques on undergraduate interior architecture students' UD solutions in the design process. To explore the effects of building empathy and its reflections in design studio process, it investigates how experiencing ED process has an impact on students' empathy level, decision making process and perceptions of learning experience.

Design studio process is important as the focal point of interior design education and all the other courses taught in the curriculum are associated with the design studio (Demirbaş and Demirkan, 2003; 2007; Uluoğlu, 2000). Design is a problem-solving process and the extent of experience of designer is significant. In traditional design studios, mostly passive roles are adopted by students such as listening, note-taking, following the instructions, and practicing them as discussed in critiques (Boudhraa et al., 2021; Goldschmidt, 2002; Sagun et al., 2001). Hence, there need to be additional and supportive methods that should be included in traditional

* *Corresponding Author;* Department of Interior Architecture and Environmental Design, Bilkent University, Ankara, TÜRKİYE.

** Department of Interior Architecture and Environmental Design, I.D. Bilkent University, Ankara, TÜRKİYE.

design process that would enhance the experience of students. ED could be added as a supportive method in design process since it enhances students' empathy ability towards all people and interactions with people who they design for (Heylighen and Dong, 2019). Also, it develops their imagination in use of the product or environment that they created while increasing their creative thinking for innovative design solutions and providing codesign activities.

Following the introduction, this paper is organized in five sections. In the first section, we discuss the theoretical framework based on ED approach to achieve the needs of users with diverse abilities in interior design process. In the second section, we describe the ED process under the methodological approach of the study that also consists of participants, experimental setting, instruments, procedure, data collection and data analysis methods. Then in the third section, we present the results based on the quantitative, qualitative, and mixed data analysis. In the discussion section, qualitative and quantitative findings of this research are compared in terms of similarities and differences with the present literature sources in which the theoretical framework is grounded. Finally in the last section, we draw conclusions and discuss the strengths and limitations of the ED approach in design studio process.

THEORETICAL FRAMEWORK

ED approach enhances the design experience of students as it is presented into the design studio process. Integrating ED approach to design studio process improves students' awareness of human experiences, and more universally designed environments are generated through applying UD and HF/E principles in design process.

Universal Design in Design Process

UD is described as "an approach to creating environments and products that are usable by all people to the greatest extent possible" (Mace et al., 1991, 156). Later, this definition is extended by the addition of 'without the need for adaptation or specialized design' (The Center for Universal Design, 1997). This implication indicated that UD dismisses the adaptable and special design approaches for facilitating the requirements of people with diverse abilities and elderly (Erkılıç, 2011). The aim of UD is not only to create better design solutions, but also it emphasizes the process of designing products or environments by considering all people regardless of their age, ability, or size of users (Ostroff, 2001). A number of experts in the fields of architecture, product development, engineering design at North Carolina State University developed the seven principles of UD namely as (1) Equitable use, (2) Flexibility in use, (3) Simple and intuitive use, (4) Perceptible information, (5) Tolerance for error, (6) Low physical effort and (7) Size and Space for approach twenty-eight guidelines (The Center for Universal Design, 1997) to lead designers in developing UD solutions. The researchers expressed that the principles of UD were not developed just for good design, but these were developed for universally usable design. They also added that other factors such as aesthetic, cost, safety, gender, and culture should be considered.

To fulfill the need of users with a wide range of abilities, there is a growing awareness on UD among designers and design educators (Afacan, 2008; Altay and Demirkan, 2014; Demirbilek and Demirkan, 2004). Several studies in the educational field emphasized the importance of UD

education and integrated UD approach into the design process by applying various pedagogic strategies and methods and utilized the seven UD principles as an evaluation method in their studies. For instance, Olguntürk and Demirkan (2009) designed the objectives of the course called 'Current Issues in Interior Design I/ Universal Design' based on the seven principles of UD the principles of HF/E in the Department of Interior Architecture and Environmental Design at I.D. Bilkent University, in Ankara, Turkey. This course used two teaching approaches; one was based on lectures, and the other one was building evaluations from students. According to the students' feedback, they acquired more information about principles of UD and HF/E and their skills in the evaluation of public building according to the UD and HF/E principles were increased. Also, their design solutions were enriched (Olguntürk and Demirkan, 2009). Ergenoğlu (2013) investigated how UD could be integrated into design thinking among undergraduate architecture students at Yıldız Technical University, in Istanbul, Turkey. The aim of the study was to assess the level of awareness of students in accessibility issues in designed spaces using a multi-dimensional approach. Different teaching methods as lectures, seminars (by the lecturer and people with diverse abilities about sharing their own experiences), site visits, role-playing exercises and video presentations were applied into the UD course. Ergenoğlu (2015) also developed a learning method and presented a UD education model for architecture students. Another similar study (Helvacıoğlu and Karamanoğlu, 2012) underlined the significance of UD in education process and the awareness of the UD concepts. Researchers interviewed students from the department of Interior Architecture and Environmental Design at Atılım University, Ankara, Turkey. The researchers found that most interior design students need to know the concept and context of the UD. So, the researchers suggested that there should be more educational settings such as workshops, courses, conferences, etc., to develop UD concept in academic and design environments (Helvacıoğlu and Karamanoğlu, 2012). Another similar experimental course module was developed by the educators in the Institute of Design at Oslo School of Architecture and Design, Norway (Vavik, 2011). The researcher proposed a holistic model with a pedagogical aim and embody user involvement in UD process in the course called 'User Oriented Design'. Students made direct contact with their end users and designed for them. At the end of their meetings, the students stated the user involvement forced them to gain experience while using this learning strategy. Another strategy as an experimental learning of disability was used by Mulligan, Calder and Mulligan (2018) in architectural education, in New-Zealand. Their study highlighted that UD need to begin at the start of the design process. The experiential learning module about UD was developed by collaboration among architectural design teaching staff and research physiotherapists who are experts in disability issues. The module composed of three parts 'an information session, a practical role-playing experience, and a supported reflection and discussion session' and was experienced by the twenty-four undergraduate architectural students. According to the findings of the study, students' perceptions of UD were explored in their reflections on their design practice and students learned about the perspectives of people with diverse abilities. Furthermore, Dong (2010) studied different teaching strategies with undergraduate design students to teach UD, in United Kingdom and researcher proposed using personas, scenarios and co-design may be applied as different strategies. In these studies, the holistic way of teaching was supported, and multi-dimensional approach is suggested and stated that UD education should

involve mixed methods (Dong, 2010; Ergenoğlu, 2013; 2015; Helvacioğlu and Karamanoğlu, 2012; Mulligan et al., 2018; Olguntürk and Demirkan, 2009; Vavik, 2011). As critical reflection, self-awareness of learning, observing, experiential learning are the tools that researchers emphasized besides lecturing, discussing, and searching. To create universally designed products or environments, designers need to increase their empathic understandings, as empathy is an inseparable part of design that enhances the living qualities of people (Campbell and McDonagh, 2009). As an additional and supportive educational method, empathic design and its research techniques and strategies could be used in design education.

Empathic Design

Empathic design is an observation-oriented research method (Leonard and Rayport, 1997) and as one of the human-centered design approaches (Steen, 2011) that has been used since the late 1990s (Suri, 2001). Design researchers mainly focused on exploring the empathic ways of learning and assessed the empathic process by gathering reflections from students. They reported positive impacts of ED process in design, as they received positive feedbacks on students learning experience and outcomes (Altay, 2017; Altay et al., 2016; Altay and Demirkan, 2014; Surma-aho and Hölttä-Otto, 2022).

Several techniques and research strategies were developed for providing a deep understanding of people with diverse abilities. Kouprie and Visser (2009) emphasized that empathy can be enhanced by stepwise process and developed a framework that consists of four phases: (1) discovery, (2) immersion, (3) connection and (4) detachment. They divided ED techniques into three major research strategies in the design process. Firstly, techniques for creating “direct contact between designers and users (research)” (Kouprie and Visser, 2009, 439) that include several techniques, such as observing, interviewing, and codesigning. In design process, as an example, students observed people with diverse abilities while conducting physical activities at their home by a field visit and obtained direct feedback on the use of the environment or products. In addition, students collected data about user’s needs and problems by interviewing them or their relatives (Altay, 2017; Gomez-Lanier, 2018; van Rijn et al., 2011). Also, some studies investigated how codesigning with people with diverse abilities’ have an influence on students’ design solutions (Hess and Fila, 2016; Ho, Ma and Lee, 2011). Secondly, “techniques for communicating findings of user studies to design teams (communication)” (Kouprie and Visser, 2009, 439) that could be practiced, when it is not possible to have direct contact with users. Students collected data about users by using special communication tools such as storyboards, personas, empathy map (EM), (Bairaktarova et al., 2016; Tschimmel, 2012) or video recordings (van Rijn et al., 2011). Thirdly, “techniques for evoking the designer’s own experiences in a domain relevant to the user (ideation)” (Kouprie and Visser, 2009, 439) were realized by taking the perspective of users or assimilating their abilities and act as a user, called role-playing. In many studies, students assumed people with diverse abilities’ role by restricting their sensorial or physical abilities to deeply understand their problems, encountered obstacles and experiences in a campus environment (Altay and Demirkan, 2014; Altay et al., 2016; Kocaoğlu and Demirkan, 2019; Mulligan et al., 2018). However, most instructional research in interior architecture focused on research and ideation phases, but rarely investigated communication, and comparison of these three techniques. In

this respect, this study aims to investigate the effectiveness of the three ED techniques and explores how experiencing ED process reflect on students' empathy, design process and perceptions of their learning experience. As a result, the research questions are proposed as follows:

1. How does experiencing empathic design process affect interior architecture students' individual differences in multiple dimensions of empathy?
2. How does experiencing empathic design process reflect the interior architecture students' design process based on finding universal solutions?
3. What are the reflections of experiencing empathic design process on students' perceptions of their learning experience?

THE EMPATHIC DESIGN PROCESS

In this section, the ED process is grounded on the four phases of Kouprie and Visser's (2009) study that is structured on Merrill's First Principles of Instruction (Merrill, 2002) is explored. Also, the participants, experimental setting, instruments, procedure, data collection and analyzes methods are introduced.

The objective of this study is to investigate how experiencing ED process have an influence on students' design process. The assumption is that more universally designed interior projects would be created if empathic understanding is promoted by integrating problem-based learning with collaborative group tasks into the interior design process. The methodology of the study involves mixed research method. The empirical research is carried out based on the four phases of empathy framework (discovery, immersion, connection, and detachment) presented by Kouprie and Visser (2009) and the educational objectives of the study are structured according to Merrill's First Principles of Instruction (1. problem centered, 2. activation, 3. demonstration, 4. application, and 5. integration) (Merrill, 2002) (Figure 1). The study is accomplished at a digital environment. Students conduct the tasks by participating in online sessions, because of Covid-19 pandemic.

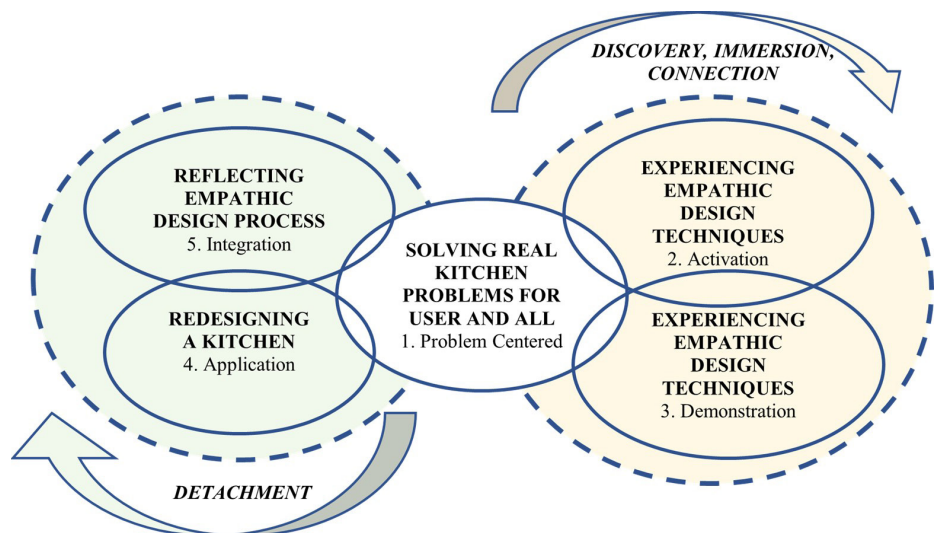


Figure 1. Conceptual framework based on the four phases (discovery, immersion, connection, and detachment) of empathy framework (Kouprie & Visser 2009) and Merrill's First Principles of Instruction (1. problem centered, 2. activation, 3. demonstration, 4. application, and 5. integration) (Merrill, 2002).



Figure 2. The user kitchen environment from two points of view (Source: First Author).

Participants

The approval of the ethics committee at I.D. Bilkent University was obtained before starting the experiment (No: 2020_11_23_01). The participants are twelve second-year students (9 female and 3 male) ($M_{age} = 23$ years) from the Department Interior Architecture and Environmental Design at I.D. Bilkent University. Participation in this study is entirely on voluntary basis. The user of this study is a woman at the age of 60 with the height of 1.55 cm and has a broken arm caused by a home accident. She thinks that her kitchen is not particularly useful, accessible and do not have appropriate size and spaces.

Experimental Setting

The experimental setting is an online environment where all students participate in online sessions. Group A visited the user's kitchen environment, Group B attended the lecture and created an EM and Group C conducted the role-playing activities in their own kitchen environment. All groups participated in design sessions and group interviews on the online environments. The user kitchen environment is on an apartment flat (135 square meters) with a balcony (3.5 square meters), has L-shaped layout type and has a floor area of 16 square meters, and its ceiling height is 2.60 meters (**Figure 2**). This kitchen involves some interior design features that are not designed according to the UD principles and guidelines.

Instruments

The instruments used for the quantitative data collection consist of the Interpersonal Reactivity Index (IRI) developed by Davis (1980; 1983) and the kitchen survey that is adapted from Afacan and Demirkan's (2010) study. The instruments for qualitative analysis are the design brief, lecture on ED, researcher's logbook, and semi-structured interviews.

Procedure

The students are randomly assigned to four groups, each composed of three students (S1, S2 and S3) and labelled as Group A (S1A, S2A, S3A), Group B (S1B, S2B, S3B), Group C (S1C, S2C S3C), and Group D (S1D, S2D S3D) as the control group. Students are asked to complete seven tasks in one week (**Figure 3**). At the beginning of the experiment, the multiple dimensions of empathy, namely as, fantasy (FS), perspective taking (PT), empathic concern (EC), personal distress (PD) are measured by IRI (Davis 1980, 1983). Firstly, students in each group (A, B, C and D) filled

out the IRI and sent their responses to the researcher via e-mail (task 1). Then Groups A, B and C experienced three different ED techniques in three days. Group A built direct contact with the user by interviewing and observing. Group B experienced techniques for communicating, as they attended a lecture about ED and learned special communication tools, observed the user through video and created an EM. Group C (each member) was asked to play a broken arm role and perform the role-playing activities (cook pasta for one person and eat it) in their own kitchens. In order not to create hazardous situation for students, a helper guided each student and recorded the video. Group C members attended the others' sessions to watch their friends' activities (task 2, discovery, immersion, and connection). Then, each group (A, B, C and D) redesigned the user's kitchen with an increase in understanding of user needs and considering all people's challenges for generating improved design solutions. Four independent online meetings were organized in two days and duration of each meeting was 2.5 hours. The design brief and the plan drawing of the user's kitchen were uploaded for each group. The researcher observed the students without interfering with their design decisions. The design sessions were recorded (task 3, detachment). Then, only Group A visited the user's kitchen in an online session and presented their design ideas

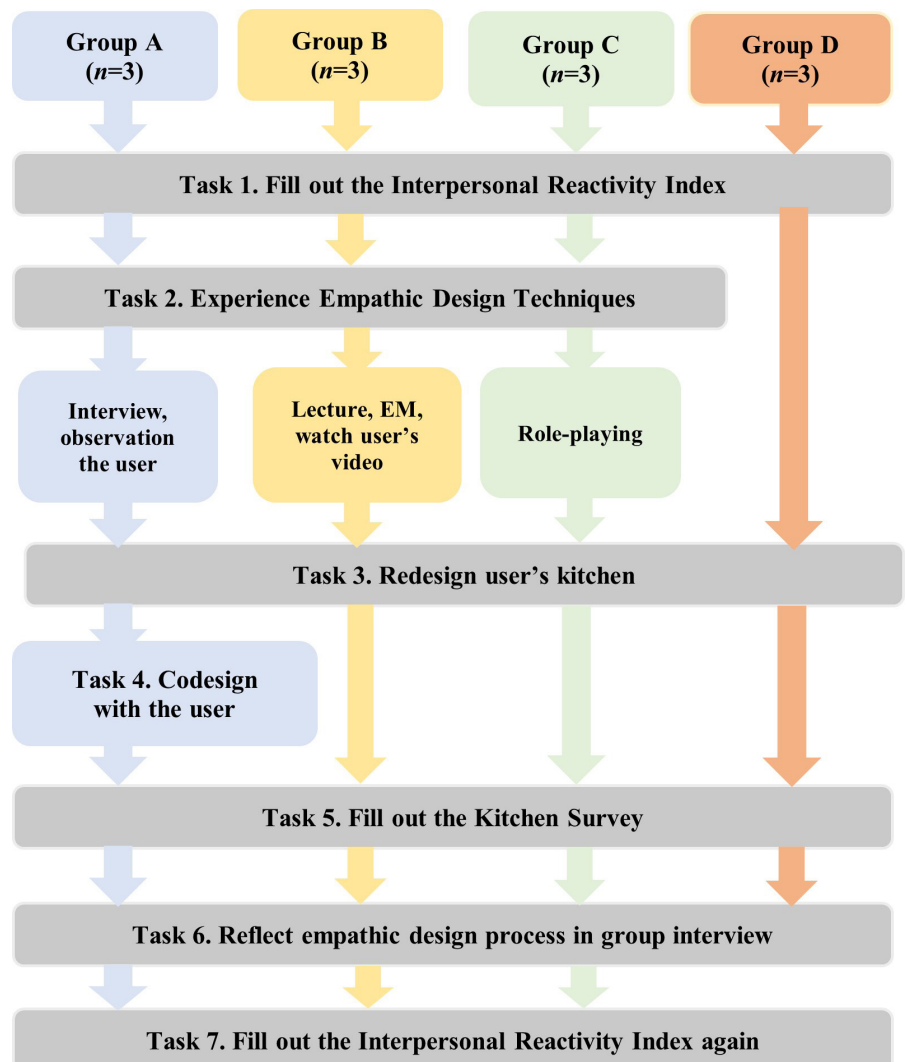


Figure 3. Procedure of the study showing the tasks accomplished by all groups in the empathic design process.

and codesigned with the user (task 4). Students in all groups were asked to fill in the kitchen survey from the user who has a broken arm's point of view. They were asked to rank the importance level for each 47 kitchen design items on a scale of 1-5 (1 being the least important and 5 the most important) (task 5). All students participated in the group interview to discuss and share their experiences in ED process and answered the researcher's questions. The interview session was recorded (task 6, detachment). At the end of the group interview, students were asked to fill in the IRI again and send their answers to the researcher (task 7) (Figures 3-7).

According to Merrill's First Principles of Instruction (Merrill 2002), students were asked to complete the learning tasks and solve the universal kitchen design problems (principle 1: problem-centered). Students remembered the relevant previous ED experiences in the design process (principle 2: activation). Demonstrations like information from a lecture to be given to the students, interview, and EM are considered as new knowledge (principle 3: demonstration). Students were asked to apply their newly acquired knowledge and empathy skills in solving a kitchen design problem in the redesign of the user's kitchen (principle 4: application). Lastly, students were encouraged to reflect on and discuss the new knowledge and skills in group interviews and expected to transfer them into their future design projects (principle 5: integration).

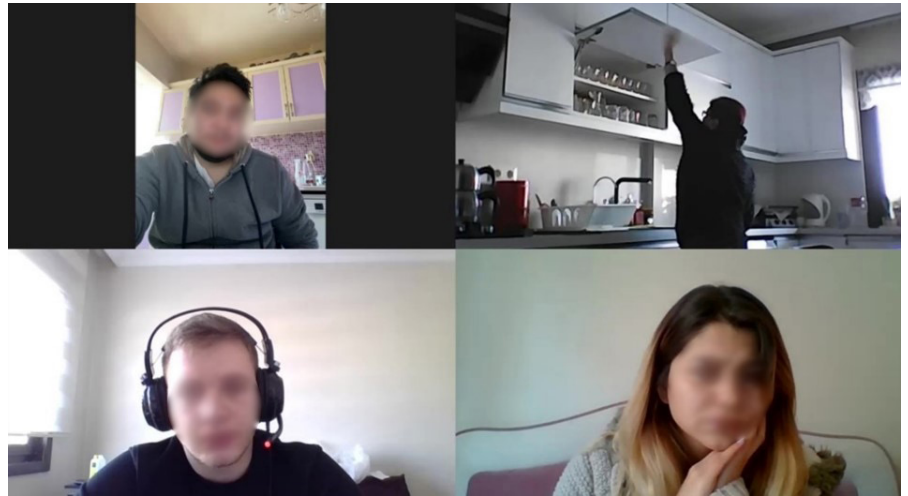


Figure 4. Group A observing the kitchen activities of the user.

Figure 5. Group B listening to the lecture and learning to make an EM.



Figure 6. S2C conducts role-playing activities while other members and researcher watches her.

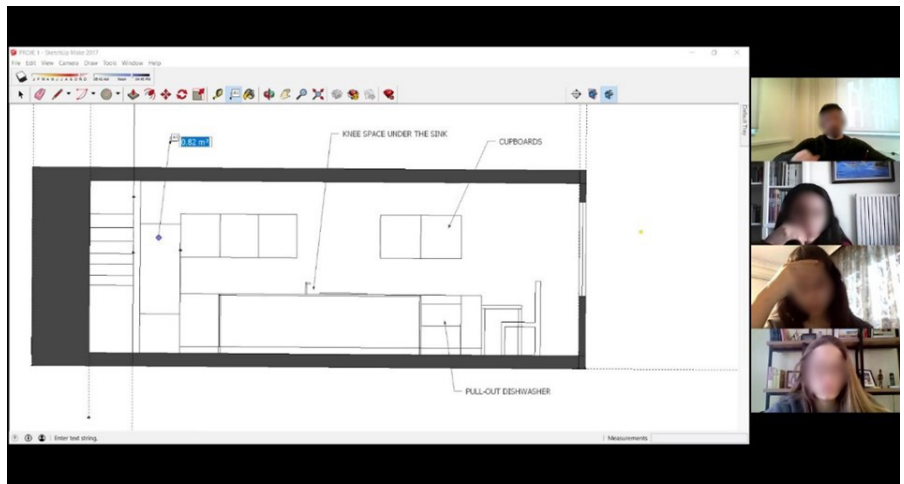


Figure 7. Group B re-design user's kitchen collaboratively as researcher observes them.

Data Collection and Analysis Methods

The data collection methods of qualitative research are behavioral observations, researcher's logbook, video recordings of online sessions, verbal response measurements (group interview and design conversations). The data collection methods for quantitative research are written response measurements of IRI (Davis, 1980; 1983) and the kitchen survey developed in Afacan and Demirkan's study (2010). The kitchen survey originally consisted of eight categories and 87 items that aims to identify the kitchen needs of diverse user groups, but the detailed 40 items related to controls and appliances are not included in this study, since the requirements of the design brief do not involve the fine details about them. Consequently, the kitchen survey used in this study consists of 7 categories and 47 items. Mixed data analyses are used. The qualitative data analysis method is thematic analysis. The transcripts from video records including data obtained from the group interviews, and design conversation protocols are analyzed by the thematic analysis. Schön (1987) stated that reflexive conversations as protocols should be analyzed deeply to understand teaching and learning processes. The six-phase approach developed by Braun and Clarke (2006) are followed and the codes are manually identified in manifest level with the reference to Boyatzis's study (1998) and characterized as data driven. The codes are identified as the code label, the

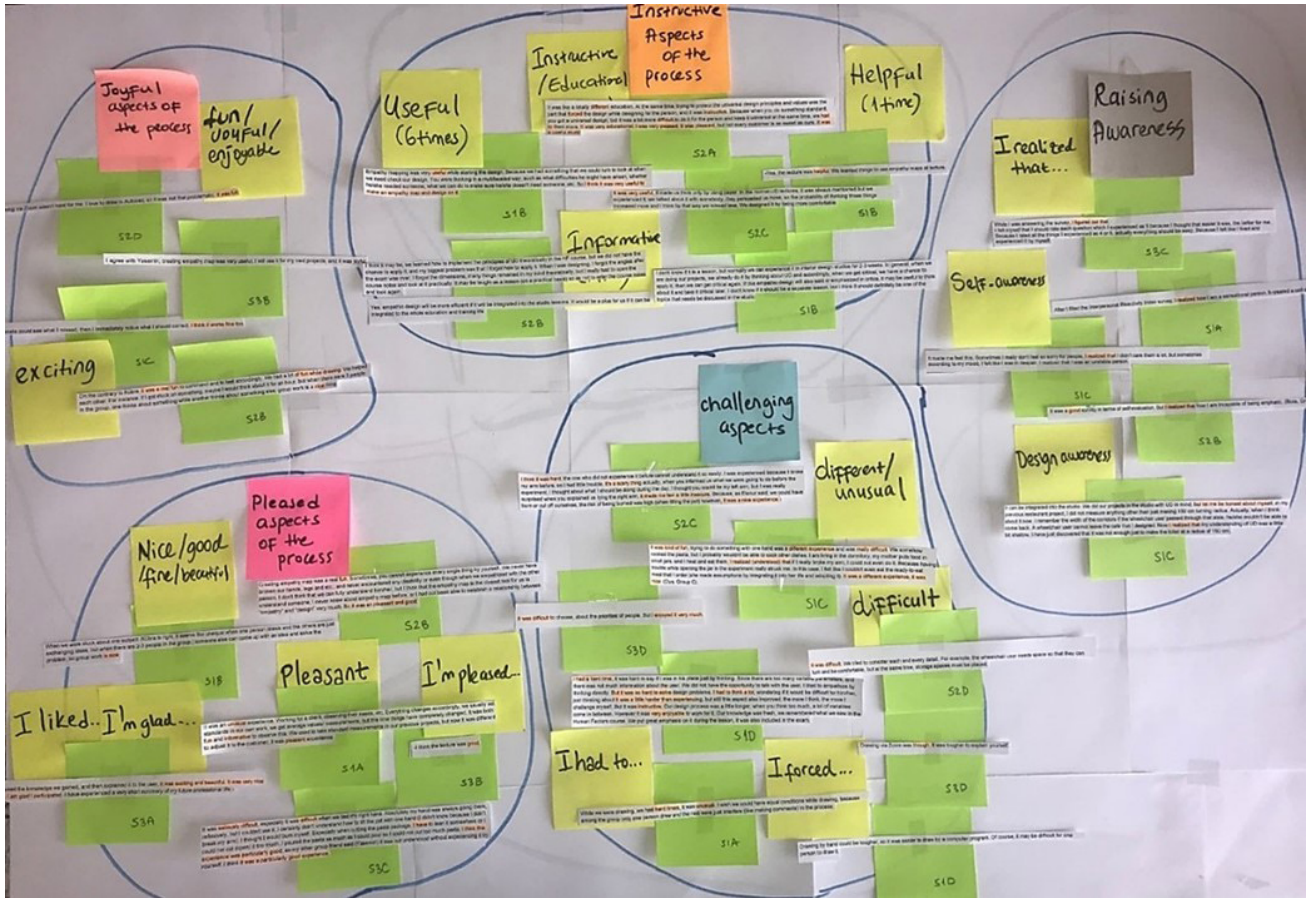


Figure 8. A visual presentation of codes in theme groups.

definition of what the theme contains, and the relevant indicators that are determined and lastly the examples are presented as differentiation in each group. Then, the visual presentation is generated to see the similarities, differences, and relationships between codes (Figure 8). Then, codes are examined and collated into potential themes. The collated codes are reanalyzed and developed by generating thematic maps, then themes and subthemes are defined and named, and the report is produced.

The quantitative data analysis is conducted through statistical analysis methods consisting of descriptive statistics and correlation analysis. All quantitative data were analyzed by using the Statistical Package for the Social Sciences (SPSS, version 19) software.

RESULTS

Analysis of the IRI and the kitchen survey provided the data for the quantitative data analyses. Students' reflections on the ED process that were the results of the thematic analysis and the information transmitted in the design conversations related to the design process provided the data for the qualitative data analysis. Furthermore, correlation analysis among the universal kitchen design items and the corresponding themes are explored.

On the Analysis of the IRI

To answer the research question 1, the univariate analysis of variance test is used to find out if there is a significant difference between the IRI scores of pre-tests and post-tests (Figure 9). Each response from Groups

A, B, and C were scored and calculated into four different dimensions of empathy considering both cognitive (FS and PT) and affective (EC and PD) components of empathy. As seen in Figure 9, the descriptive statistics and the univariate analysis of variance indicated that in FS dimension the scores of both Group A ($M_{pre} = 16.00$, $SD = 7.81$, $M_{post} = 18.33$, $SD = 6.51$) and C ($M_{pre} = 17.33$, $SD = 4.62$, $M_{post} = 19.33$, $SD = 1.53$) have increased, while Group B ($M_{pre} = 21.33$, $SD = 5.04$, $M_{post} = 20.00$, $SD = 6.08$) has decreased. In PT dimension the scores of Group B remained almost constant ($M_{pre} = 23.00$, $SD = 3.00$, $M_{post} = 23.00$, $SD = 4.36$), Group A had a small decrease in scores ($M_{pre} = 19.00$, $SD = 2.00$, $M_{post} = 18.33$, $SD = 5.78$) and there was an increase in the scores of Group C ($M_{pre} = 16.00$, $SD = 2.65$, $M_{post} = 19.33$, $SD = 2.08$). In EC dimension, the scores of Group A ($M_{pre} = 18.33$, $SD = 3.06$, $M_{post} = 18.00$, $SD = 3.60$) and B ($M_{pre} = 18.67$, $SD = 2.08$, $M_{post} = 16.33$, $SD = 3.21$) have decreased, but in Group C ($M_{pre} = 17.33$, $SD = 2.08$, $M_{post} = 19.67$, $SD = 4.51$) it has increased. In PD dimension, the scores of both Group A ($M_{pre} = 13.00$, $SD = 5.29$, $M_{post} = 10.67$, $SD = 0.58$) and B ($M_{pre} = 12.67$, $SD = 3.79$, $M_{post} = 11.67$, $SD = 0.58$) have decreased, while Group C ($M_{pre} = 14.67$, $SD = 3.22$, $M_{post} = 16.00$, $SD = 6.00$) have increased.

To summarize, in PT dimension (related with cognitive component of empathy), the scores of Group B remained almost constant, Group A had a small decrease in scores and there was an increase in the scores of Group C. In EC dimension (related with affective component of empathy), the scores of Group A and B have decreased, but in Group C it has increased. In PT dimension (related with affective component of empathy), the scores of both Group A and B have decreased, while Group C have increased. Only in the FS dimension (related with cognitive component of empathy), the scores of both group A and C have increased, while group B has decreased but in the other IRI dimensions (PT, EC, and PD), the scores of group C always have increased.

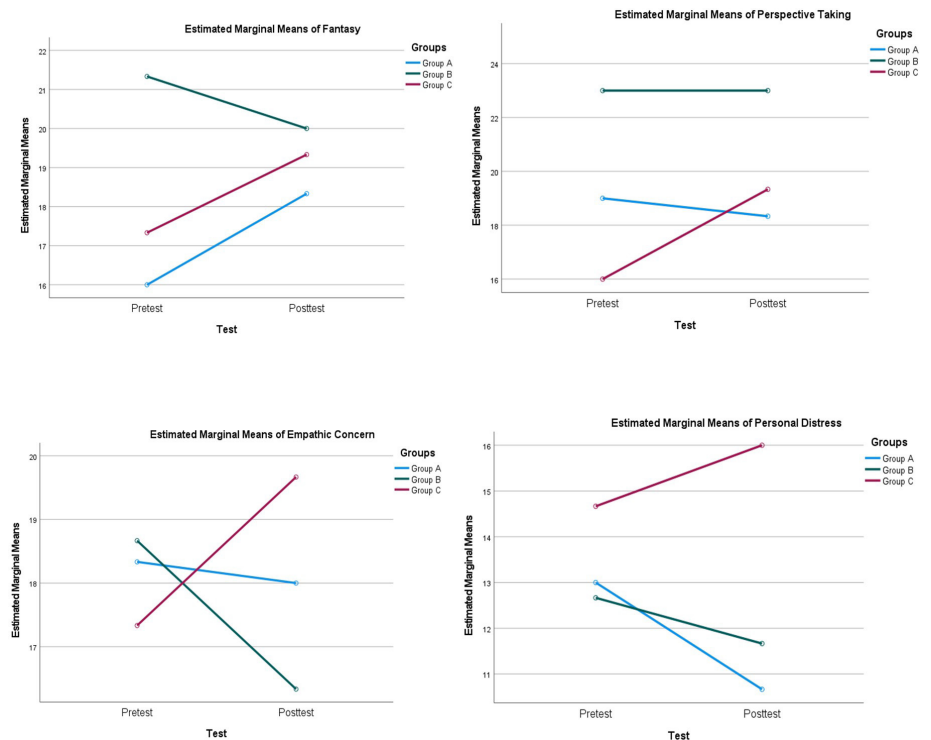


Figure 9. Univariate analysis of variance of each IRI subscales in pre-tests and post-tests for each group.

On the Analysis of the Kitchen Survey

Students and the user ranked their importance level for each 47 kitchen design items in 7 categories as; category 1- circulation includes 5 items, category 2- cabinets and storage areas includes 10 items, category 3- counters/work surfaces include 10 items, category 4- appliances includes 10 items, category 5- sink and faucets includes 3 items, category 6-illumination includes 4 items, and category 7- materials includes 5 items) in working successfully within a kitchen environment. To understand to what extent the students became aware of the user's needs after experiencing ED techniques, the students filled out the kitchen survey from the user with a broken arm's point of view. The user filled out the survey at the beginning of the experiment.

The group ratings were analyzed to determine the level of empathic understanding of each group and the degree of similarity with the user. Also, the kitchen survey category levels were analyzed to find if there was a significant difference in the ratings of the different ED technique groups. Three missing values were noted from 'cabinets and storage' category. Since the level of measurement was ordinal, the best central tendency measurement for the data is the median (Md), and the median scores for the total categories was equal for Groups A, B, and the user (Md =4.00). Only group C's median score was different (Md =5.00). The equal scores indicated the similarity level of empathic understanding of students on their user's needs. Students' awareness on understanding of the kitchen user's priorities was enhanced through ED techniques. A one-way unrelated analysis of variance showed an overall significant effect of the emphatic techniques in the ratings of the kitchen survey categories, $F(4,30) = 5.42, p = 0.002$. Scheffe's test indicated that the direct contact group A ($M = 3.71, SD = 0.49$) differed from the role-playing group C ($M = 4.71, SD = 0.39$) at $p = 0.012$, and from the control group D ($M = 4.64, SD = 0.63$) at $p = 0.023$, but no other significant differences were found.

On the Thematic Analysis

The data from (1) group interviews and (2) design conversations among students in design process are analyzed thematically. The result of students' reflections in group interview are categorized as learning process and learning outcome and indicated three emergent themes (Theme 1. Instructive aspects of empathic design process, Theme 2. Affective aspects of empathic design process, Theme 3. Raising awareness in design process) and four subthemes (Subtheme 2.1 Pleasant aspects of empathic design process, Subtheme 2.2 Challenging aspects of empathic design process, Subtheme 3.1 The self-awareness and Subtheme 3.2 Design awareness). Secondly, the analysis of students' design conversations protocols in design process revealed two major themes (Theme 4. Past experiences and Theme 5. Universal design solutions) and twelve subthemes (Subtheme 4.1 Individual empathic design experiences, Subtheme 4.2 Experiences from prior courses, Subtheme 5.1 Passages and circulation spaces, Subtheme 5.2 Reach problem of cabinets, Subtheme 5.3 Inadequacy of storage cabinets and areas, Subtheme 5.4 Safety, Subtheme 5.5 Sequence of use- work centers and counters, Subtheme 5.6 Accessibility of appliances, Subtheme 5.7 Dining table height (posture problem), Subtheme 5.8 Adjustable dining table, Subtheme 5.9 Illumination and Subtheme 5.10 Materials) as seen in **Table 1**.

Analysis	Category	Major Themes and Subthemes
Group Interview	Learning Process	<p>Theme 1 Instructive aspects of empathic design process</p> <p>Theme 2 Affective aspects of empathic design process</p> <ul style="list-style-type: none"> • Subtheme 2.1 Pleasant aspects of empathic design process • Subtheme 2.2 Challenging aspects of empathic design process
	Learning Outcome	<p>Theme 3 Raising awareness in design process</p> <ul style="list-style-type: none"> • Subtheme 3.1 The self-awareness • Subtheme 3.2 Design awareness
Design Conversations	Design Process	<p>Theme 4 Past experiences</p> <ul style="list-style-type: none"> • Subtheme 4.1 Individual empathic design experiences • Subtheme 4.2 Experiences from prior courses
		<p>Theme 5 Universal design solutions</p> <ul style="list-style-type: none"> • Subtheme 5.1 Passages and circulation spaces • Subtheme 5.2 Reach problem of cabinets • Subtheme 5.3 Inadequacy of storage cabinets and areas • Subtheme 5.4 Safety • Subtheme 5.5 Sequence of use, work centers and counters • Subtheme 5.6 Accessibility of appliances • Subtheme 5.7 Dining table height (posture problem) • Subtheme 5.8 Adjustable dining table • Subtheme 5.9 Illumination • Subtheme 5.10 Materials

Table 1. Themes and subthemes that emerged as a result of the thematic analysis

Students' Reflections on Empathic Design Process

All students participated in the group interview online session (task 6). According to students' reflections, the first theme revealed was related to the instructive aspects of the ED process. Students mentioned the words useful (six times), instructive/educational (four times), informative (one time) and helpful (one time) to describe the learning process.

It was like a totally different education. At the same time, trying to protect the UD principles and values was the part that forced us, but it was instructive...It was very educational; I was very pleased. It was a useful study (S1A).

Group A also underlined the importance of building empathy in design education and made suggestions. To illustrate, S2A emphasized the practical basis of the empathic design approach as a design learning tool, and he suggested that empathic design approach should be integrated into the Interior Design Studio course. One student in Group B also highlighted learning by doing approach and suggested that empathic design should be integrated to design critics of design projects in Interior Design Studio

courses. Group C emphasized that learning by experience was more instructive than just attending the lecture.

The second emergent theme affective aspects of empathic design process included two subthemes as pleasant and challenging aspects. Nice, good, fine and beautiful (eleven times), enjoyable/fun/ joyful/exciting (eight times), difficult (thirteen times), different/unusual (six times) were the words that students used frequently to describe the process. Besides, some students started their responses with I forced..., I had to... (two times) to express the difficulties that they have faced.

I liked that we used the knowledge we gained, and then explained it to the user in codesign, it was exciting and beautiful. It was also nice and instructive process (S1A).

I am glad that I have participated. I have experienced a short summary of my future professional life (S3A).

Trying to do something with one arm was a different and difficult experience (S2C).

All groups also commented on working collaboratively in an online session. They all agreed that they used to work online. However, S1A found drawing together via Zoom was difficult and unusual. Specifically, she found it unusual that only one student was drawing, and the others were intervening verbally. However, S2A found working collaboratively was fun and he emphasized the importance of helping each other when drawing and exchanging ideas to find the appropriate design solutions.

The third theme was raising awareness consisting of two subthemes as self-awareness and design awareness. Several students' comments included explicit expressions about raising his/her self-awareness and design awareness and some students started their responses as I realized that... (six times).

Sometimes, you cannot experience everything by yourself. We never have broken our arm, leg etc., and never encountered any disability...I had not been able to establish a relationship between empathy and design very much. So, it was pleasant and good experience for me (S2B).

One student in Group C explained her design awareness by giving an example from her previous design project as shown in the excerpt below:

We did our projects in the studio with UD in mind, but let me be honest about myself, in my restaurant project in Interior Design Studio course, I did not measure anything other than just providing 150 cm turning radius for a wheelchair user. When I think it over now, I remembered the width of the corridors is not accessible for a wheelchair or walker user. If the wheelchair user pass through that aisle, he/she would not be able to come back so, a wheelchair user cannot leave the cafe that I designed (S1C).

Students also commented that filling out kitchen survey increased their design awareness, since they recognized the important design characteristics of kitchen environment from the user's point of view and IRI raised their self-awareness.

After I filled the IRI, I became aware that I was a sensitive person (S1A).

Students' Conversations in Design Process

All groups participated in the online design sessions (task 3). The fourth theme (twelve times) was about the design approach of each group. It was based on the students' recalls of their past experiences in generating UD

solutions derived from their individual empathic design experiences and accumulated knowledge from their prior courses.

Each group had a different approach to the design problem. Group A recalled the knowledge that they gained from the interview and observation session. Their design approach was mostly user-centered, since they mainly focused on the problematic areas of the kitchen related to accessibility and reach problems of the user. Group B occasionally recalled their EM. Group C remembered their role-playing activities. They indicated the most empathic approaches since they tried to build the relationship between their experience and user's experience. Their problem-solving approach was activity-based, as they created scenarios and designed accordingly. Group D was indecisive in finding a design solution and needed extra time to finish their drawings. They generally focused on wheelchair users in accessibility issues.

We should place a counter next to the refrigerator since in the role-playing exercise, I had difficulty in putting the jar into the refrigerator. I looked for a counter for putting down the jar and then opened the door. Then I got the jar and put it into the refrigerator (S1C).

The fifth theme was the universal design solutions that were applied in design process. Students spoke aloud and tried to generate appropriate UD solutions. Ten subthemes were revealed. The most frequently repeated subtheme was subtheme 5.1. Passages and circulation (31 times) and the least mentioned was subtheme 5.8 adjustable dining table (3 times).

We must consider a knee-space under the sink for a wheelchair user (S1B).

We should locate the refrigerator, sink and cooker according to the principle of the work triangle (S2A).

Correlation Analysis among Universal Kitchen Design Items and Subthemes 5

The relationship between the importance rank given to the universal kitchen design items in kitchen survey (1) circulation, (2) cabinets and storage areas, (3) counters/work surfaces, (4) appliances, (5) sink and faucets, (6) illumination, and (7) materials) and the number of universal kitchen design items proposed in the UD process were analysed using Somers' *d* measure of association. According to the results, there is a very strong positive correlation between the number of universal kitchen design items (dependent variable) used in the UD process and the importance rank given to the universal kitchen design items (independent variable) in Group A (Somers' $d=0.90$, $p=0.009$) at alpha level 0.05. To illustrate, Group A ranked their importance level as $Md=4.00$ (out of 5) for category 1- circulation and proposed 4 (out of 5) circulation design items in their kitchen design. They provided enough free space for the passages and circulation spaces and allocated adequate clear floor area by breaking down the balcony wall, enclosed balcony with glass and designed that space as a dining area, opened the kitchen door to the outside so that the wheelchair or walker user could pass easily. Also, they proposed a 150 cm radius free space to make a 360-degree turn for wheelchair users. They also proposed a non-intersecting work triangle between the refrigerator, sink and cooking surface, although they did not propose an adequate clearance at the side of the dining table. No significant relationship is found between these variables in Groups B, C and D. Moreover, the relationship between

the number of universal kitchen design items proposed in the UD process and the frequency of UD solutions (Theme 5- subtheme 5.1 Passages and circulation spaces, 5.2. Reach problem of cabinets, 5.3. Inadequacy of storage cabinets and areas, 5.5. Sequence of use, work centers and counters, 5.6. Accessibility of appliances, 5.9. Illumination, 5.10. Materials) mentioned in the design conversation were analyzed using the Gamma measure of association. Subthemes 5.4. Safety, 5.7. Dining table height (posture problem) and 5.8 Adjustable dining table were not included in the analysis since they could not match with the universal kitchen design items in kitchen survey. The results indicated that there is a significant moderate association between the frequency of subthemes 5 in design process and the number of items used in the UD process in Group C (Gamma= 0.579, $p=0.021$) and Group D (Gamma= 0.667, $p=0.010$) at alpha level 0.05. To illustrate, Group C mentioned subtheme 5.5 six times and proposed 8 (out of 10) universal kitchen design items. They did activity analyzes and recalled the right sequence of use as sink-counter-cooker-counter. While considering the sequence of use, they considered left and right-handed person for access and use. They also remembered the difficulties that they had faced in their role-playing activities and thought that the user could face the same problems. One student recalled that she had trouble opening the refrigerator door with the jar in one hand and proposed an appropriate counter space at the opening side of the refrigerator. There was no significant relationship between these variables in Groups A and B.

DISCUSSION

On the Results of IRI and Kitchen Survey

We expected that students' FS, EC, and PT dimensions of empathy would increase, and PD decrease after experiencing the ED process, since PD is negatively correlated with the EC and PT dimensions (Davis, 1983). However, only Group C's FS, EC, PT were increased and interestingly their PD scores also were increased. This may be the consequence of the role-playing activities, where the students took the user's perspective and acted as if they had a broken arm, and their empathy was increased. So, simulating people with diverse user's abilities enhanced students' empathic understanding as in the previous studies (Altay et al., 2016; Kocaoğlu and Demirkan, 2019; McDonagh and Thomas, 2010). About the PD dimension, Group A and B's PD scores decreased as expected but Group C's PD scores were increased. Group C members were stressed in completing the role-playing activities. So, their personal anxiety could have increased. The findings of the kitchen survey indicated that there is no statistically significant difference between the groups A and B and user in ranking the importance level of universal kitchen design items. This similarity indicated the level of empathic understanding of students on the user's needs. This may be the reason that students could understand the user's priorities better for the sake of direct contact, lecture and creating an EM collaboratively.

On the Results of Thematic Analysis and Correlation Analysis

About the instructive aspects of ED process, students commented that learning by experiencing approach is more effective than the lecture which only involved acquiring theoretical knowledge, since the knowledge had better settle in their minds (Altay, 2017; Altay et al. (2016). The sub-theme 4.1. Individual empathic design experiences were directly related

to the subtheme 3.2. Design awareness and all were associated with the fifth theme Universal design solutions. When students recalled their ED experiences, their design awareness increased, and they tried to find more UD solutions. So, remembering individual ED experiences positively affected students' design awareness and caused them to find UD solutions. The common findings of the similar studies that students commented on learning by experience was more distinct and educative. The students also proposed that the ED approach on practical basis could be in the curriculum (McDonagh and Thomas, 2010) and practical experiences were important knowledge sources in design process that would lead to successful design outcomes (Strickfaden and Devlieger, 2011; McDonagh, 2015; McDonagh et al., 2011). Moreover, the EM was found as a useful tool in understanding the user's priorities and needs even though it was a new tool for students. In Bairaktarova et al. (2016)'s study, EM technique as one of the ED techniques was found to be helpful for engineering students to find better design solutions.

The affective aspects included pleasant aspects of revealed enjoyable feedbacks, as it was found to be a very important component of a perceived learning experience. In Altay et al. (2016) and Altay (2017) studies, enjoyable quality of the empathic design process was found as one of the emergent themes. Students also stated collaborative design process was fun (Altay et al., 2016) and emphasized the significance of helping each other when drawing and exchanging ideas to find the design solutions. Challenging aspects of the students positively affected students' self and design awareness and encouraged them to find more UD solutions. The students had difficulties in doing the activities, they had left their comfort zones and forced themselves to empathize with the user (Campbell and McDonagh, 2009). The sub-theme 2.1 Challenging aspects of the empathic design process was directly associated with the third theme raising awareness and the fifth theme universal design solutions. While the students were acquiring knowledge about the problems, barriers, needs and expectations of the user by observing, listening and/or experiencing, they had faced some difficulties, and they became more aware of the difficulties in the life of a person with an impairment. Thus, their self and design awareness were increased, and they tried to find more UD solutions. Altay and Demirkan's (2014) study also found that difficult was the most repeated word used by interior architecture students to describe their empathic design process.

Students' expressions in their learning outcomes also indicated positive feedbacks including a psychological self-awareness and design awareness (Altay and Demirkan, 2014; Altay et al., 2016). Some students realized that their previous design projects were not universal and criticized themselves on this issue. This inference is so vital for novice interior designers to create more UD solutions, since their understanding of user context was expanded and realized how essential and difficult it was to design while considering both the user with diverse ability and all people. This understanding was noteworthy since one of the intentions of this study was to make students understand that ED research is not only for people with diverse abilities but also for all people (McDonagh, 2015).

The findings of analysis on design conversations were supported by the correlation analysis since the association between the number of universal kitchen design items proposed and the frequency of UD solutions (subthemes 5) mentioned in the design conversation indicated that Group

C mentioned the greatest number of subthemes 5, their designs involved more design items. The findings suggested that role-playing was more effective ED technique to deeply understand the user and find more universal solutions (Altay et al., 2016; Gomez-Lanier, 2018) compared to the other techniques. Another association analysis indicated that since Group A was using the technique of direct contact; the interaction between the designers and user through observation, interview, and codesign had an influence on this finding (van Rijn et al., 2011). Group A understood the user's needs and problems better through the direct contact method and conducted extensive research to obtain information about the user as well as ranking the importance level through the user's point of view, efficiently. The results indicated that direct contact was successful way of expressing empathy and understanding the user (Heylighen et al., 2013; van Rijn et al., 2011). The findings also indicated that experiencing ED technique shortens the design time and helped the designer in finding UD solutions easily since in this study Group D (control group) had a hard time finding a design solution and needed extra time to complete their drawings.

There were some limitations of the empathic approach in learning and teaching universal design. Since empathic ways of learning asked students to leave their comfort zone and required a comprehensive and in-depth analysis on design problems, they were forced in learning universal design. Especially, while finding design solutions, it was difficult for them to consider the needs and problems of both the user with a broken arm and everyone. In addition, some students had difficulties as safety issue while they were trying to conduct role-playing activities in their own kitchen environment (Altay and Demirkan, 2014). Also, there were some limitations of the empathic approach in teaching universal design. Since students were interviewing and co-designing real user for the first time, they needed encouragement. Also, it was so difficult to control students' safety remotely while they were conducting the role-playing activities.

The findings of the analysis of students' reflections were supported in the earlier research with similar findings that had analyzed students' learning processes and outcomes in an ED experience through thematic analysis (Altay, 2017; Altay et al., 2016).

CONCLUSION

This study explored the impact of experiencing three ED techniques in interior design process and assess students' reflections related to their learning process and outcomes. Collaborative learning with multi-method approach occurred in every task. Students experienced ED techniques in discovery, immersion, and connection phases and re-designed a kitchen and reflected their ED experiences in detachment phase (Kouprie and Visser, 2009). The learning activities were designed based on the Merrill's First Principles of Instruction (Merrill, 2002). These principles were valuable criteria in the ED learning activities, and they were found to be compatible for online education and supported collaboration among students to work together.

Firstly, this study questioned how does experiencing ED process influence interior architecture students' individual differences in multiple dimensions of empathy. To answer the first question, the cognitive (FS and PT) and affective (EC and PD) empathy components were measured and analyzed to see whether there was an increase. Quantitative analysis

indicated that Group C's (role-playing technique) empathy scores were increased in all dimensions of empathy and the role-playing technique was found to be more effective than the other techniques in developing students' empathy. Secondly, it was examined the reflection of ED process on students' design process based on finding UD solutions. The thematic analysis in design process revealed that empathic approach as a design learning tool improved students' problem-solving skill and encouraged them to integrate UD and HF/E principles into their end products. Two emergent themes (4. past experiences and 5. universal design solutions) indicated that students mostly remembered the theoretical knowledge that they had acquired in the prior courses and determined their practical knowledge from their ED experience to produce UD solutions. Also, experiencing ED techniques influenced students' design decision making process positively. To illustrate, Group A was user-centered, Group B recalled their EM and Group C was activity-based while proposing design solutions. It was found that each learning method in ED has its own potential as stated in the previous literature (Altay and Demirkan, 2014) and mainly helpful and effective in supporting the learning domain, but role-playing technique was found more effective towards finding universal solutions compared to the others. Thirdly, this study examined the reflections of experiencing ED process on students' perceptions of their learning experience. The findings of the thematic analysis demonstrated that experiencing ED influences students' perceptions positively, since it expands their empathic understanding of the challenges of people with diverse abilities encounter and increases their self-awareness and design awareness. The three emergent themes (1. instructive aspects of the empathic design process, 2. affective aspects of the empathic design process and 3. raising awareness in the design process) supported these reflections. In addition, the findings of the kitchen survey indicated that students' design awareness (subtheme 3.2) on understanding the user's priorities and needs was enhanced, since there was similarity between the scores from the students and the user. As they had never filled out a survey from someone else's perspective before, it was new and different experience for them, and they commented that they recognized the important design characteristics of kitchen environment from the user's (with temporary physical impairment) point of view.

The major limitation of the study was Covid-19 pandemic situation. So, the experiment was carried out with a limited number of students with time restriction in online sessions. Future studies might increase the number of students and duration of sessions. Also, students may conduct each ED techniques in face-to-face sessions. This study contributes to the literature by exploring reflections of empathic design process on interior architecture students' universal design solutions. With the guidance of this study, design educators can compare the effectiveness of different teaching methods in design process. Many universities have theoretical courses titled as Human Factors or Ergonomics, or Universal Design. In these courses, the instructors could introduce the ED approach and demonstrate the ED techniques by emphasizing their importance (Altay and Demirkan, 2014; Altay, 2017) or empathic way of learning could be incorporated to 'Interior Design Studio' courses by integrating related assignments. Design educators could also apply different and additional learning methods including empathic approach to promote students to create more universally designed projects. In ED process, students can have fun and be pleased but they can have difficulties, but it would reflect positively on

their design process as it realized in this study. Since, this study indicated that building empathy plays a significant role in developing successful interior design projects in architectural education.

ACKNOWLEDGEMENTS

The authors would like to thank Naz A. G. Z. Börekçi and Burçak Altay for their valuable comments at all stages of this research. Also, we thank all students and the user for their participation.

BIBLIOGRAPHY

- AFACAN, Y. (2008) *A computer Assisted Universal Design (CAUD) Plug-in Tool for Architectural Design Process*, unpublished Ph.D. Dissertation, Bilkent University, Ankara.
- AFACAN, Y., DEMİRKAN, H. (2010) A priority-based approach for satisfying the diverse users' needs, capabilities and expectations: a universal kitchen design case, *Journal of Engineering Design* 21(2-3) 315-43.
- ALTAY, B. (2017) Developing empathy towards older adults in design, *Educational Gerontology* 43(4) 198-208.
- ALTAY, B., BALLICE, G., BENGİSU, E., ALKAN-KORKMAZ, S., PAYKOÇ, E. (2016) Embracing Student Experience in Inclusive Design Education through Learner-Centered Instruction, *International Journal of Inclusive Education* 20(11) 1123-41.
- ALTAY B., DEMİRKAN, H. (2014) Inclusive Design: developing students' knowledge and attitude through empathic modelling, *International Journal of Inclusive Education* 18(2) 196-217.
- BAIRAKTAROVA, D., BERNSTEIN, W.Z., REID, T., RAMANI, K. (2016) Beyond Surface Knowledge: An Exploration of How Empathic Design techniques enhances Engineers Understanding of Users' Needs, *International Journal of Engineering Education* 32(1) A 111-22.
- BOUDHRAA, S., DORTA, T., MILOVANOVIC, J., PIERINI, D. (2021) Co-ideation critique unfolded: an exploratory study of a co-design studio 'crit' based on the students' experience, *CoDesign* 17(2) 119-38.
- BOYATZIS, R.E. (1998) *Transforming Qualitative information: Thematic Analysis and Code Development*, Thousand Oaks, CA: Sage.
- BRAUN, V., CLARKE, V. (2006) Using Thematic Analysis in Psychology, *Qualitative Research in Psychology* 3(2) 77-101.
- CAMPBELL, L., MCDONAGH, D. (2009) Visual Narrative Research Methods as Performance in Industrial Design Education, *Qualitative Inquiry* 15(3) 587-606.
- DAVIS, M.H. (1980) A multidimensional approach to individual differences in empathy, *JSAS Catalog of Selected Documents in Psychology* (10) 85-103.
- DAVIS, M.H. (1983) Measuring individual differences in empathy: Evidence for a multidimensional approach, *Journal of Personality and Social Psychology* 44(1) 113-26.
- DEMİRBAŞ, O.O., DEMİRKAN, H. (2003) Focus on architectural design process through learning styles, *Design studies* 24(5) 437-56.

- DEMİRBAŞ, O.O., DEMİRKAN, H. (2007) Learning styles of design students and the relationship of academic performance and gender in design education, *Learning and Instruction* 17(3) 345-59.
- DEMİRBILEK, O., DEMİRKAN, H. (2004) Universal product design involving elderly users: a participatory design model, *Applied Ergonomics* (35) 361-70.
- DONG, H. (2010) Strategies for teaching inclusive design, *Journal of Engineering Design*, 21(2-3), 237-51.
- ERGENOĞLU, A.S. (2013) Accessibility awareness among architecture students: Design thinking evaluations in Yıldız Technical University, *Procedia-Social and Behavioral Sciences* (89) 312-7.
- ERGENOĞLU A.S. (2015) Universal design teaching in architectural education, *Procedia-Social and Behavioral Sciences* (174) 1397-403.
- ERKILIÇ, M. (2011) Conceptual Challenges Between Universal Design and Disability Relation to the Body, Impairment, and the Environment, *METU Journal of Faculty of Architecture* 28(2) 181-203.
- GOLDSCHMIDT, G. (2002) 'One-On-One': A Pedagogic Base for Design Instruction in the Studio, *Proceedings of Common Ground, Design Research Society International Conference*, eds. Durling, D. and Shackleton, J., Brunel University: Staffordshire University Press, London, UK, 430-437.
- GOMEZ-LANIER, L. (2018) The role of empathy in experiential learning: A case study of empathy as an interior design learning tool, *International Journal of Social Sciences Studies* 6(4) 20-9.
- HELVACIOĞLU, E., KARAMANOĞLU, N.N. (2012) Awareness of the concept of universal design in design education, *Procedia- Social and Behavioral Sciences* (51) 99-103.
- HESS, J.L., FILA, N.D. (2016) The manifestation of empathy within design: findings from a service-learning course, *CoDesign* 12(NOS. 1-2) 93-111.
- HEYLIGHEN, A., VAN DOREN, C., VERMEERSCH, P.W. (2013) Enriching Our Understanding of Architecture Through Disability Experience, *Open house international* 38(1) 7-19.
- HEYLIGHEN, A., DONG, A. (2019) To empathise or not to empathise? Empathy and its limits in design, *Design Studies* (65) 107-124.
- HO, D.K., MA, J., LEE, Y. (2011) Empathy@ design research: a phenomenological study on young people experiencing participatory design for social inclusion, *CoDesign* 7(2) 95-106.
- KOÇAOĞLU, M., DEMİRKAN, H. (2019) An Experiential Study on Empathic Design in Interior Architecture Education, *International Journal of Contemporary Urban Affairs* 3(3) 15-26.
- KOUPRIE, M., VISSER, F. (2009) A framework for empathy in design: stepping into and out of the user's life, *Journal of Engineering Design* (20) 437-48.
- LEONARD, D., RAYPORT, J.F. (1997) Spark Innovation through Empathic Design, *Harvard Business Review* 75(6) 102-13.

- MACE, R.L., HARDIE, G.J., PLACE, J.P. (1991) *Accessible environments: Toward universal design*. eds. W. Preiser, J. Vischer, and E. White, *Design Interventions: Towards a More Human Architecture*, Van Nostrand Reinhold, New York.
- MCDONAGH, D. (2015) Design students foreseeing the unforeseeable: Practice-based empathic research methods, *International Journal of Education through Art* 11(3) 421-431.
- MCDONAGH, D., THOMAS, J. (2010) Disability + Relevant Design: Empathic Design Strategies Supporting More Effective New Product Design Outcomes, *The Design Journal* 13(2) 180-198.
- MCDONAGH, D., THOMAS, J., STRICKFADEN, M. (2011) Empathic Design Research: Moving Towards a New Mode of Industrial Design Education, *Design Principles & Practice: An International Journal* 5(4) 301-13.
- MERRILL, M.D. (2002) First Principles of Instruction, *Educational Technology, Research and Development* 50(3) 43-59.
- MULLIGAN, K., CALDER, A., MULLIGAN, H. (2018) Inclusive design in architectural practice: Experiential learning of disability in architectural education, *Disability and Health Journal* (11) 237-42.
- OLGUNTÜRK, N., DEMİRKAN, H. (2009) Ergonomics and Universal Design in Interior Architecture Education, *METU Journal of Faculty of Architecture* 26(2) 123-38.
- OSTROFF, E. (2001) Universal Design: The new paradigm. In *Universal Design Handbook*, edited by Wolfgang F. E. Preiser and Elaine Ostroff, 1.3-1.12. New York: McGraw-Hill.
- SAGUN, A., DEMİRKAN, H., GOKTEPE, M. (2001) A Framework for the Design Studio in Web-Based Education, *Journal of Art and Design Education* 20(3) 332-342.
- SCHÖN, D.A. (1987) *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*, San Francisco, CA, USA, Jossey-Bass Inc.
- STEEN, M. (2011) Tensions in human-centered design, *CoDesign* 7(1) 45-60.
- STRICKFADEN, M., DEVLIEGER, P. (2011) Empathy through Accumulating Techne: Designing an Accessible Metro, *The Design Journal* 14(2) 207-29.
- SURI, F.J. (2001) The next 50 years: future challenges and opportunities for empathy in our science, *Ergonomics* 44(14) 1278-89.
- SURMA-AHO, A., HÖLTTÄ-OTTO, K. (2022) Conceptualization and operationalization of empathy in design research, *Design Studies* (78) 101075.
- THE CENTER FOR UNIVERSAL DESIGN (1997) The Principles of Universal Design Version 2.0. Raleigh, NC, NCSU, [https://projects.ncsu.edu/ncsu/design/cud/pubs_p/docs/poster.pdf] Access Date (28.12.2021).
- TSCHIMMEL, K. (2012) Design Thinking as an effective Toolkit for Innovation, *Proceedings of the XXIII ISPIM Conference: Action for Innovation: Innovating from Experience*, The International Society for

Professional Innovation Management (ISPIM),. Barcelona, Spain, 1-20.

ULUOĞLU, B. (2000) Design Knowledge Communicated in Studio Critiques, *Design Studies* 21(1) 33–58.

VAN RIJN, H., VISSER, F., STAPPERS, P.J., OZAKAR, A.D. (2011) Achieving empathy with users: The effects of different sources of information, *CoDesign* 7(2) 65-77.

VAVIK, T. (2011) Strategies for Teaching Universal Design, *Proceedings of the 13th International Conference on Engineering and Product Design Education*, 8 & 9 September, City University, London, UK, 360-365.

SYMBOLS AND ABBREVIATIONS

EC: Empathic Concern

ED: Empathic Design

EM: Empathy Map

FS: Fantasy

HF/E: Human Factors/Ergonomics

IRI: Interpersonal Reactivity Index

M: Mean

Md: Median

SD: Standard Deviation

SPSS: Statistical Package for Social Sciences

PT: Perspective Taking

PD: Personal Distress

UD: Universal Design

Alındı: 06.04.2022; Son Metin: 26.01.2023

Anahtar Sözcükler: Tasarım eğitimi; tasarım süreci; empatik tasarım; insan faktörleri, evrensel tasarım.

EMPATİK TASARIM SÜRECİNİN İÇ MİMARLIK ÖĞRENCİLERİNİN EVRENSEL TASARIM ÇÖZÜMLERİNE YANSIMASI

Çoğu iç mimarlık öğrencisi, evrensel tasarım yaklaşımını ve insan faktörleri/ergonomi prensiplerini projelerine yansıtmak konusunda zorluklarla karşılaşır. Tasarım eğitiminde, öğrencilerin empati yetisi artıkça, evrensel tasarım anlayışları da artar ve daha erişilebilir, kullanışlı evrensel ürünler ve/veya mekanlar tasarlanabilir. Bu çalışma, empatik tasarım tekniklerinin, öğrencilerin tasarım sürecindeki evrensel tasarım çözümleri üzerine yansımalarını incelemektedir. Kullanıcı (kolu kırık olan) hakkında veri toplamak için, 12 ikinci sınıf iç mimarlık öğrencisi (kontrol grubunda bulunan 3 öğrenci hariç, Grup D) bir öğrenme yöntemi olarak empatik tasarım tekniklerini (Grup A, kullanıcı ile doğrudan temas etme, Grup B, kullanıcılar hakkında dolaylı bilgi edinme ve derse katılma ve Grup C, rol alma tekniği) deneyimlemiştir. Daha sonra tüm katılan öğrenciler (12 kişi) kullanıcının mevcut mutfağını yeniden tasarlayarak, öğrendiklerini tasarımlarına yansıtmıştır. Çalışma Covid-19 pandemisi nedeniyle çevrim içi ortamda gerçekleştirilmiştir. Grup görüşmeleri ve tasarım sürecindeki konuşmaları içeren video kayıtlarından elde edilen dökümler, tematik olarak analiz edilmiştir. Sonuçlar empatik tasarım sürecinin, öğrencilerin öğrenme deneyimleri ve tasarım çıktılarındaki olumlu yansımalarını, öz farkındalık ve tasarım farkındalıklarının artışı

olarak göstermektedir. Öğrenciler önceki ders bilgilerini ve bireysel empatik tasarım tekniği deneyimlerini, evrensel tasarım çözümlerini üretirken hatırlamışlardır. Üç empatik tasarım tekniği öğrencilerin tasarım odaklı düşünme yaklaşımını farklılaştırdığı için, öğrencilerin evrensel tasarım çözümleri üzerinde olumlu etkisi olmuştur. Tasarım çözümleri önerirken, Grup A kullanıcı merkezliydi, Grup B empati haritalarını hatırladı, Grup C aktivite tabanlıydı ama Grup D kararsızdı ve çizimlerini tamamlamak için fazladan zamana gereksinim duydu. Her bir empatik tasarım tekniği, öğrenme alanını desteklemeye yardımcı olmuştur, ancak rol alma tekniği diğer tekniklere kıyasla empati seviyesini artırma ve evrensel tasarım çözümleri bulma konusunda daha etkili olmuştur.

REFLECTION OF EMPATHIC DESIGN PROCESS ON INTERIOR ARCHITECTURE STUDENTS' UNIVERSAL DESIGN SOLUTIONS

Most interior architecture students encounter challenges in reflecting the universal design (UD) approach and applying human factors and ergonomics (HF/E) principles in their design projects. In design education, as students' empathic ability develops, their UD understanding enhances, and they can design more accessible, usable, and universal products or environments. This study explores the reflections of empathic design (ED) techniques on students' UD solutions in the design process. Twelve second-year (except control group, Group D, n=3) interior architecture undergraduate students experienced an ED technique (Group A, direct contact with the user, Group B, obtaining indirect information about the user and attending a lecture, Group C, role-playing) as a learning method to collect data about the user (with a broken arm), then all participated students (n=12) redesigned the existing kitchen of the user and reflected their learning and design outcomes. The case study was conducted virtually because of the Covid-19 pandemic. The transcripts from video recordings, including the data collected from group interviews and design conversations, are analyzed thematically. The results demonstrated that experiencing ED is positively reflected in students' perceptions of their learning experiences and outcomes with an increase in self-awareness and design awareness. Students remembered their prior courses' knowledge and their individual ED experiences to produce UD solutions. Three ED techniques positively influence students' UD solutions since they change students' design thinking approach. Group A was user-centered, Group B recalled their EM, and Group C was activity-based while proposing design solutions. However, Group D was indecisive and needed extra time to complete the requirements. Each ED technique is particularly helpful in supporting the learning domain, but the role-playing technique is found to be more effective in increasing empathy levels and finding UD solutions compared to the others.

MELİS YEŞİLTEPE; BFA, MFA

Received her BFA and MFA degrees from the Department of Interior Architecture and Environmental Design at Bilkent University. Currently a Ph.D. candidate at Bilkent University Department of IAED. Academic research interests include design education, empathic design, universal design, and human factors. melis.yesiltepe@bilkent.edu.tr

HALİME DEMİRKAN; B.Sc., M.Sc., Ph.D.

Received her bachelor's and master's degrees in industrial engineering and Ph.D. degree in architecture from Middle East Technical University (METU). Major research interests include design creativity, design cognition, design education and human factors in design. demirkan@bilkent.edu.tr

CO-DESIGN WITH CHILDREN WITH CANCER: INSIGHTS FROM WHAT THEY SAY, MAKE, AND DO (1)

Melis ÖRNEKOĞLU SELÇUK*, Deniz HASIRCI**,
Ayça TUNÇ COX***

Received: 07.10.2021; **Final Text:** 07.03.2023

Keywords: Children with cancer; co-design process; children's hospital; play area; modularity

1. This article is derived from the corresponding author's master's thesis, supervised by; Assoc. Prof. Dr. Ayça Tunç-Cox and Prof. Dr. Deniz Hasirci. In the scope of the thesis, another paper (Örnekoğlu-Selçuk et al., 2022) gives more detailed information regarding the importance of communication during co-design with children with cancer. The aforementioned conference paper was presented at the 5th National Design Research Conference UTAK 2022. This article complements that work with its focus on the design recommendations, suggestions for facilitators and the link between QOL and co-design sessions.

* *Corresponding Author;* Department of Industrial Systems Engineering and Product Design, Ghent University, Ghent, BELGIUM.

** Department of Interior Architecture and Environmental Design, İzmir University of Economics, İzmir, TÜRKİYE.

*** Department of Industrial Design, İzmir Institute of Technology, İzmir, TÜRKİYE.

INTRODUCTION

Despite attempts to change children's objectified position from 'human becoming' to 'human being,' they are often marginalized in society (Skivenes and Strandbu, 2006; Kellett, 2009). Generally, children are not directly asked to express their ideas or needs in many situations that affect them, instead, adults decide on their behalf. Children diagnosed with cancer become even more marginalized and their quality of life (QOL) decreases due to their lack of control and the severity of their illness and treatment (Hilda et al., 2015).

Playing has a vital role in children's QOL for maintaining the development of children and coping with stress caused by hospital unfamiliarity (Carvalho e Sousa et al., 2015). Play activities are particularly beneficial for hospitalized children since they provide a linkage to home, a sense of normalcy and control, and the ability to express feelings (Weaver & Groves, 2007). This indicates the importance of a play area for children with cancer and the need to provide well-designed play area in hospitals so as to contribute to their QOL.

To this end, scrutinizing the needs of children with cancer regarding play areas in hospitals is crucial. Conducting co-design sessions with them might be helpful since this approach advocates an active involvement of users in the design process (Skivenes and Strandbu, 2006; Mattelmäki and Visser, 2011). Thanks to co-design sessions, children's design ideas concerning a play area in a hospital might yield recommendations that are more responsive to their needs, thereby, increasing their QOL.

Starting from this premise, this study reports on a co-design process conducted with children with cancer at a hospital in Izmir, Turkey; to generate furniture design ideas for the play area located at the Hematology and Oncology Service. It strives to provide recommendations to designers – who are deemed as facilitators of co-design sessions with children

with cancer – and a reference for further studies. Ultimately, this study promotes the active involvement of children with cancer in co-design processes, underlining the possible connections between their participation in co-designing and their QOL.

Quality of Life (QOL) of Children with Cancer

QOL is the state of well-being in terms of physical, psychological and social circumstances of human beings (Evan, 2014). Cancer diagnosis produces undesired consequences in the lives and QOL of children (Hilda et al., 2015). The side effects – illness and treatment uncertainty, interrupted daily routine and lack of play – cause a dramatic decrease in their QOL (Favara-Scacco et al., 2001).

To improve the QOL of children with cancer, non-pharmacological intervention techniques have been applied so far. Hendriks et al. (2016) have associated participatory design with perceived QOL; claiming that not just the end result but also the process itself might be beneficial for participants' QOL. Accordingly, the role of the co-design process in contributing to the QOL of children with cancer has been investigated in this study.

Co-designing with Children with Cancer

In today's world, the transition from user-centered design to participatory design (which is a collaborative approach) has led to a shift in the role of users as well as designers (Johnson et al., 2017). *Co-design* has its roots in participatory design (Steen, 2013), which gives the users that will be affected by the outcome of a design process a chance to have a voice in the design of products, services and environments (Robertson and Simonsen, 2012). Accordingly, co-design can be defined as a process in which designers are involved as facilitators as well, rather than experts, to help people with lived experience express themselves in a better way and influence the final design outcome as active participants (Mattelmäki and Visser, 2011). Sanders' (1992) approach by introducing generative techniques brings about this alteration in the role of users from passive informants to active participants. This is also in line with *generative design research* defined by Sanders and Stappers (2012) as an approach that promotes changing the role of the people from testers to design partners so as to better meet their needs.

A similar shift is noticeable in the perception of children's involvement in a design process. Previously, more passive methods (e.g. listening and consulting) were used with child participants. Hanington (2003) explained that traditional research methods like observations and interviews provide limited involvement of children. The claim is that these techniques are not conducted *with* but *on* children (Barker and Weller, 2003). Over time, children's participation gained more importance, thus, facilitating their fruitful participation in design processes became essential (Kellett, 2009).

However, the number of co-design studies with children with cancer is still limited (Ruland et al., 2008; Lindberg, 2013a; Mateus-Berr et al., 2015). Children's involvement in these studies is mostly reduced to testing (Boon et al., 2016; Warren, 2019). Particularly in industrial design, it is difficult to find studies that report on a co-design process conducted with children with cancer, not for/on them. Bearing in mind the significance of meaningful and active involvement, this study differs from the existing ones by enabling children with cancer to actively participate in the design

process and not only in tests, observations or interviews. Therefore, it is expected to contribute to existing literature. Nah and Lee (2015) emphasize the importance of actualizing children's participation by considering their rights and creating an inclusive co-design environment. Accordingly, as elaborated in section 2.2.4. Considerations, various factors have been investigated to conduct this study in a "youth-friendly" way, so that the children would not be harmed (Lindberg, 2013b).

THE CASE STUDY

This case study was conducted at the play area of the Hematology and Oncology Service of a children's hospital in Turkey. The said play area was intended to make children's hospitalization period more bearable, however, it seems not to be in active use by children. Preliminary observation of the children's daily routines and their usage of the play area was conducted to define the problem and prepare the brief for the co-design sessions. During the interviews, the hospital staff and caregivers stated that the furniture in the play area does not cater to the needs of all children, perhaps because children were not involved in its design process. Further observations later proved the significance of furniture design in the play area. This testified to the necessity for a better understanding of the needs and wishes of children with cancer regarding the play area in the hospital. Consequently, co-design sessions were conducted with them by one of the authors – who will be referred to as 'researcher' throughout the text.

Participants

In total, thirteen participants – five inpatient children with cancer, five caregivers of these children, two doctors and the head nurse – of the Hematology and Oncology Service were involved at different stages of the co-design process.

Doctors and the Nurse

First, the researcher negotiated with two doctors, an oncologist and a hematologist, for approval and advice. They guided the researcher while determining available inpatient children with cancer as participants based on their illness and treatment conditions. They aided the researcher in selecting harmless materials for the Make toolkit. Lastly, the doctors and head nurse took part in the questionnaires and interviews regarding the children's illnesses as well as the play area in the hospital.

Children with Cancer

This study was conducted with inpatient children with cancer who stay in the hospital. Unlike outpatient children, the inpatient children follow a routine that consists of several chemotherapy cycles. If their blood test results are good enough to cope with the side effects of the treatment, they stay in the hospital for chemotherapy. At the end of their required period of stay, they return home to rest.

The key criteria while determining the participants were the treatment, health condition and age of the children. This study aimed to co-design furniture with these children which could make the play area more responsive to the needs of all inpatient children. Diversity in age groups was intended to understand their varied needs. Thus, the participants were between the ages of 7 and 17.

The researcher informed potential participants and their caregivers about the study both verbally and in writing. Due to the severity of the illness, the number of participants was rather limited and the study had to be completed in a month with each child.

Caregivers of the Children

Caregivers – who are the companions of children, participated at several stages of the study. At least one caregiver with a familial relation to the children stays with them while on admission in the hospital. The researcher contacted such caregivers to arrange meetings.

Method

Generative design research was conducted in the study to facilitate the active participation of the children by using a combination of ‘Say’ (e.g., interviews), ‘Do’ (e.g., observations) and ‘Make’ (e.g., Make toolkits) tools and techniques since all three are complementary (Hanington, 2010; Sanders and Stappers, 2012). In other words, *triangulation* was used by combining different kinds of data to increase the scope and depth of this study (Flick, 2018).

Do Techniques: Observations

Observation was the first method that was applied in the preliminary stages. During the observation process, open-ended notes were taken on an observation log about four aspects: (1) the interior design of the play area (2) activities provided in the play area (3) children’s frequency of using the play area, and (4) children’s mood in the play area.

Say Techniques: Interviews and Questionnaires

Interviews were conducted with caregivers of children, two doctors and a head nurse. They were administered a questionnaire to gain insight into the children’s preferences, lifestyle, illness and QOL.

The Pediatric Quality of Life Inventory (PedsQL) is an inventory prepared for measuring QOL of children (Varni et al., 2002). PedsQL is applied to children with cancer and their caregivers before and after the co-design process to see if there will be noticeable difference in children’s QOL. PedsQL has been validated in several age groups, languages and cultures (Felder-Puig et al., 2004; Kabak et al., 2016). It also provides age-appropriate options that consider the cognitive development stage of children (Varni et al., 2002). To support PedsQL results, children and their caregivers completed a questionnaire where they were asked to evaluate the co-design process and its relation to children’s QOL. The Turkish version of the PedsQL 4.0 Generic Core Scales was available for use online.

Make Techniques: Co-design Sessions

Say techniques might not work well alone when it comes to the active involvement of children. For instance, young children might not be able to fully articulate what they need and want only through Say techniques because of their limited linguistic skills. Still, their linguistic skills might not necessarily represent their cognitive skills (Bryant, 1974). Do techniques on their own may not be the best option either since it is likely to misinterpret the children’s actions from an adult’s perspective (Grundy et al., 2012). Hence, using either one of these methods in isolation might limit the active involvement of children in the design process. Therefore, Make toolkits that may consist of countless sorts of 2D or 3D tools such as

words, photos, dummies and Legos (Sanders and Stappers, 2012) might be more inclusive for children as familiar and creative tools. Providing easy configurations and ambiguous shapes, they help children to interpret them differently in a variety of range creative ways (Lindberg, 2013b). Children can create models, collages or drawings to express themselves (Grundy et al., 2012; Lindberg, 2013b). Of course, it is still advisable to talk with them about what they created through the Make techniques to prevent any misinterpretation; this is how Say and Make techniques complement each other (Horstman et al., 2008).

Through Make techniques, the co-design sessions were conducted only with children with cancer as the main users of the play area. As a preparation for the sessions, children were given sensitizing workbooks to help them become more conscious of their experiences. After completing the activities in the workbook, participants brought them to the one-on-one co-design sessions.

Sensitizing Workbook

The sensitizing workbook included five questions in total. The first three questions were designed to gain insight on children's opinions and preferences of the existing play area. Thus, they were provided with photographs of the play area as well as "plus" (for furniture they like) and "minus" (for furniture they dislike) stickers. For question four, the page was divided into two columns – good and bad memories, and the children were given a sticker sheet that contained 91 images about different concepts. They were asked to paste them either on the right (bad memories) or left (good memories) side. In question five, children were asked to write or draw their dreams about the play area on a blank page. The last two questions were to understand their needs in and wishes for the play area.

Make Toolkit

A Make toolkit (**Figure 1**) was prepared for designing furniture for the play area to help children express themselves easily. It consisted of modules made of felt, wooden sticks of varying lengths, a 1/8 scale model of the play area made of corrugated cardboard and wooden mannequins. To make the children engage better, Lego-like plexiglas modules were prepared for the toolkit. However, felt was preferred in the end for its lightness and softness. Five different forms were prepared with 60 degrees of angle for more options while designing furniture.

Considerations

Before conducting the co-design sessions – and in light of the literature review and the analysis of observations, interviews and questionnaire results – various factors were taken into consideration to avoid any harm to children or ruin their treatment (Lindberg, 2013a). Furthermore, the factors also helped to elicit more information from children. The factors include: (1) To provide them with the necessary tools for facilitating their active participation, it is important to pay attention to their skills of expressing themselves easily (Spiel et al., 2018) taking cognizance of their age range (Fails et al., 2013) especially when conducting co-design sessions with marginalized children. Children between the ages of 7 and 10 (Piaget's (1995) concrete operational stage) can think in a logical way with concrete information, however, abstract thinking is not easy for them. Therefore, using concrete objects is recommended while conducting research with them (Lerner, 2002; Fails et al., 2013). Accordingly, a Make toolkit was

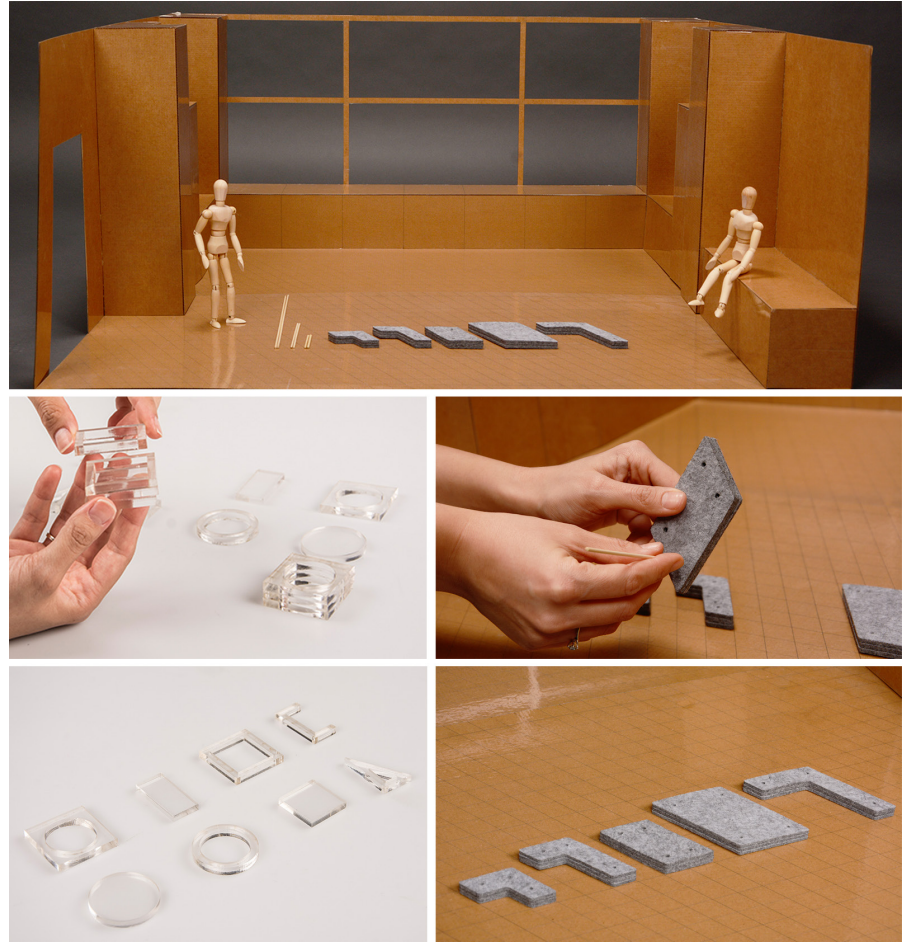


Figure 1. The Make toolkit designed by the researcher (top), the initial ideas for modules of the Make toolkit made of plexiglas (left bottom) and the final ideas for modules of the Make toolkit made of felt (right bottom) (Photography: Ersan Çelikaş)

designed to enable especially younger children who might not fully express themselves verbally to use their making skills to complement their verbal skills and communicate through design language. (2) Without changing the content, two visually different templates were prepared for the sensitizing workbooks and the Certificate of Participation for younger and older children. (3) A wooden mannequin proxy (Grundy et al., 2012) was used to make children feel more comfortable while sharing their opinions. (4) So as not to overwhelm the children, the co-design sessions were arranged to be a maximum of one hour long. (5) Co-design sessions were conducted one-on-one (Horstman et al., 2008) with each child for an in-depth investigation. (6) The researcher played games with the children and shared personal information (Horstman et al., 2008) about herself to bridge the sense of hierarchy. (7) Before and after each co-design session, the Make toolkit was cleaned with sanitizers to prevent infection. (8) At the end of the sessions, each child was presented with a Certificate of Participation and a small gift to give them a sense of feeling for contributing to the study. (9) Lastly, ethical approval was obtained from the Ethics Committee of Izmir University of Economics (B.30.2.İEÜ.0.05.05-020.20) and Non-invasive Research Ethics Board of Dokuz Eylül University (2019/06-57) before conducting this study. Additionally, all participants signed an informed consent form and pseudonyms were used for confidentiality (Kirk, 2007).

Data Analysis

The data collected through observations of the play area was analyzed through content analysis and created the base for the study. In addition, interviews and questionnaires with caregivers, doctors and the nurse provided rich data, especially with regards to information that could not be gathered through observation (e.g., illness, QOL, daily routine, children's play preferences). The results of the analysis helped to design the Make toolkit and sensitizing workbook according to the needs of children. Moreover, the co-design processes with each child were shaped in light of the data collected through observation, interviews and questionnaires. For instance, co-design sessions were conducted one-on-one with each child having learnt more about the sensitivity of their illness and the concerns of their caregivers about infection risks. The co-design sessions were recorded, photographed and transcribed for thematic analysis. The data triangulation helped to analyze the case of each child separately according to their personal needs and backgrounds (Flick, 2018).

FINDINGS

This section presents the individual insights gained from the observations and interviews during the children's one-on-one co-design processes with the researcher in relation to their backgrounds and profiles. Moreover, according to the evaluation of the questionnaire responses and PedsQL results, the children's opinions about the co-design process and its possible impact on their QOL were explained.

Insights gained during the co-design process

Co-design with Child 1

Child 1 is an 8-year-old boy diagnosed with skin cancer in May 2018. Cancer developed out of a beauty spot on his face. Since his parents keep it a secret, he is unknowing of the severity of his illness. He homeschools and has just learned how to read and write. Physically, he is energetic albeit mostly bored in the hospital for lack of friends. He is the youngest child in his family – with two older sisters. He mostly plays games on his phone and he is also keen on drawing.

He was given the sensitizing workbook in the hospital's cafeteria. His mother (caregiver) was simultaneously interviewed, too. However, during the course of the interview, she was uneasy for fear that her son might hear her. Likewise, Child 1 was also not comfortable because of the presence of a dog in the cafeteria. Thus, the venue for the next meeting shifted to the hospital's play area. He was more relaxed in the play area since he had more control over this environment. Just like the other children, Child 1 also explained all his answers on the sensitizing workbook before the commencement of the co-design session. Throughout the session, his mother commented on his ideas and helped to elicit more information from him. On top of this, the mannequin included in the Make toolkit facilitated the co-design session by attracting the attention of Child 1. During the session, he generated two furniture design ideas: a drawing chair with a rotatable part and an imaginary car (**Figure 2**).

For the last meeting, Child 1 and his mother had to meet the researcher outside the premise of the hospital. According to the child's blood test results he was not ready for the next chemotherapy session. Hence, the meeting with the researcher had to take place in the child's home. They

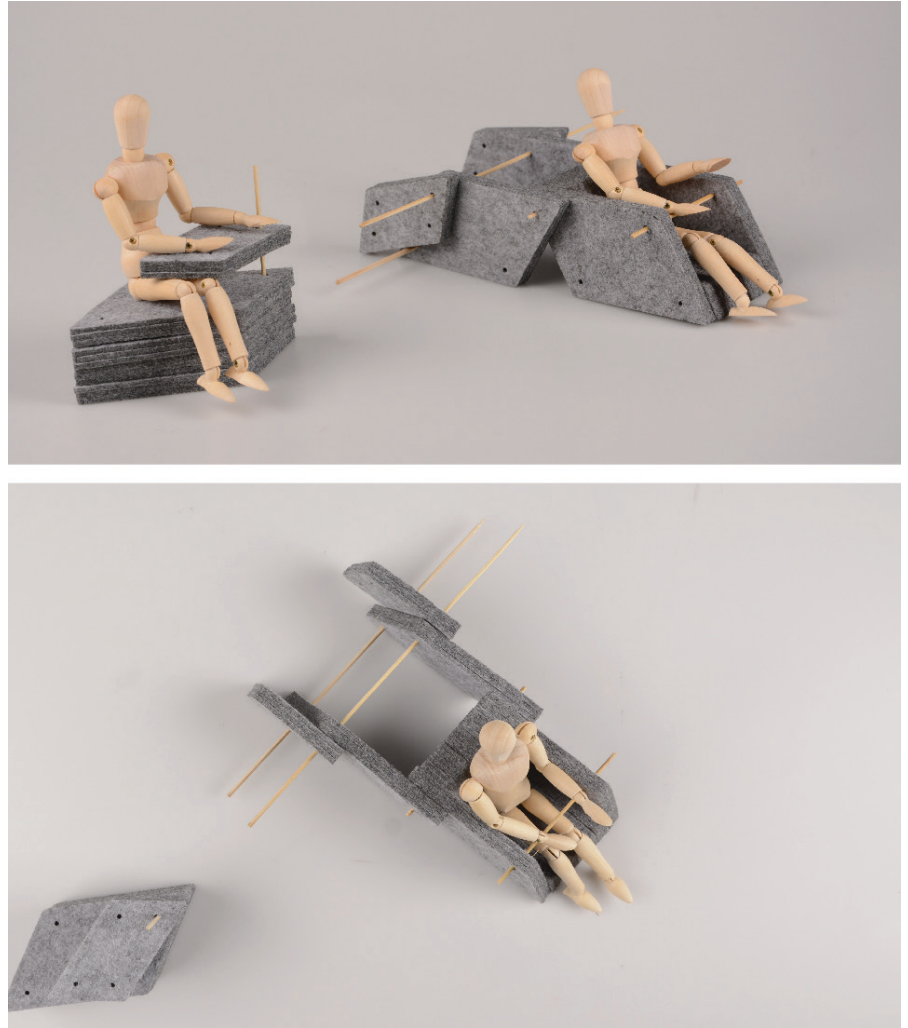


Figure 2. Furniture design ideas (top: a drawing chair with a rotatable part, bottom: an imaginary car) generated by Child 1 during the co-design session (Photography: Ersan Çeliktaş)

were glad of this development since the researcher had formed close bond with them. In the meeting, they filled out the evaluation questionnaire. Child 1 and his mother were individually presented with a Certificate of Participation and a small magnetic chess as a gift.

Co-design with Child 2

Child 2 is a 10-year-old boy diagnosed with cancer when he was 3. After his diagnosis, his mother and siblings moved to Izmir for his treatment. He is aware of his illness; knows the treatment process and its side effects since he has been living with it for 7 years. His treatment made education a tiring endeavor for him. He is quite an active child in physical and social activities. He gets along well with the nurses; even exchanging jokes with them. He spends a considerable amount of time on social media, Instagram more precisely. From the day they met, his relationship with the researcher was quite smooth. For example, on the first day of meeting, while the researcher acquainted herself with him, he shared his opinions about games and further pointed out that his most preferred is puzzles. He admitted his fondness to spend time in the play area. His attachment to his computer was obvious from how indispensable it was to him and how he brings it to the hospital to play always.

Child 2 was given the sensitizing workbook and the questions were explained in the waiting room of the hospital. He did not want the pencil given by the researcher because the colors of the pencil reminded him of the opposing football team. Thus, the pencil was replaced with an orange (his favorite color) pencil. Child 2's mother was interviewed alone and it was more efficient. In the fourth meeting, the co-design session began by discussing his answers in the sensitizing workbook as usual. During the session, his mother played a key role by bridging whatever communication gap that arose between the researcher and the child. She helped to shed more light on what the researcher said to the child by using words that were familiar to him. Even though a vascular access was affixed to his hand, he did not hesitate to use his hands to generate ideas (**Figure 3**). The session aimed to generate only one idea but because he enjoyed the activity, the child offered four different design ideas (**Figure 4**). He was very enthusiastic.



Figure 3. Child 2 enjoyed the co-design session and generating ideas with the Make toolkit (photographed by the researcher)

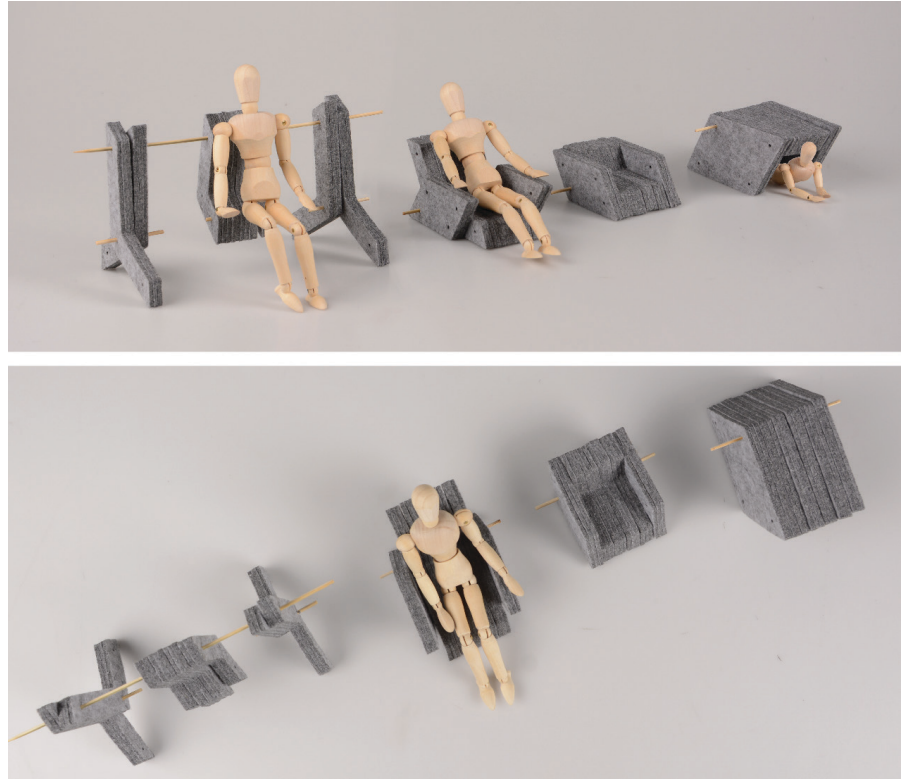


Figure 4. Furniture design ideas generated by Child 2 during the co-design session (Photography: Ersan Çeliktaş)

Of the four ideas offered by Child 2, the first was a swing: he mentioned his interest in swings in the sensitizing workbook. He also designed TV couches of different sizes for both himself and other younger children in/at the hospital. His last design was a hollow box with front and/or back openings where children can hide underneath while playing with their friends. In his sensitizing workbook, he mentioned a similar kind of playing activity with his sisters.

In the last meeting, Child 2 and his mother filled out the questionnaires in his patient room. A Certificate of Participation was presented to each of them. Additionally, the child was presented with a small gift – a small version of magnetic Parcheesi. The choice of gift was informed by the child's passion for the game during one of the meetings with the researcher.

Co-design with Child 3

Child 3 is a 12-year-old boy diagnosed with leukemia in 2018. He is on break from schooling and in Izmir for hospitalization. He reports well with doctors and nurses but does not have many friends. Playing football was his favorite activity alas, for risk of infection, he is no longer allowed to play outside. As a result, he takes his chess set with him when he stays in the hospital.

He was given the sensitizing workbook in his room and his mother was interviewed there. The third meeting – the co-design session – was scheduled to take place in the play area of the hospital to better help him remember his needs. However, due to a swelling on the child's arm, this session was conducted in his single-patient room. As usual, the session began with the child elaborating on his answers in the sensitizing workbook. Since he did not understand how to use the stickers, together

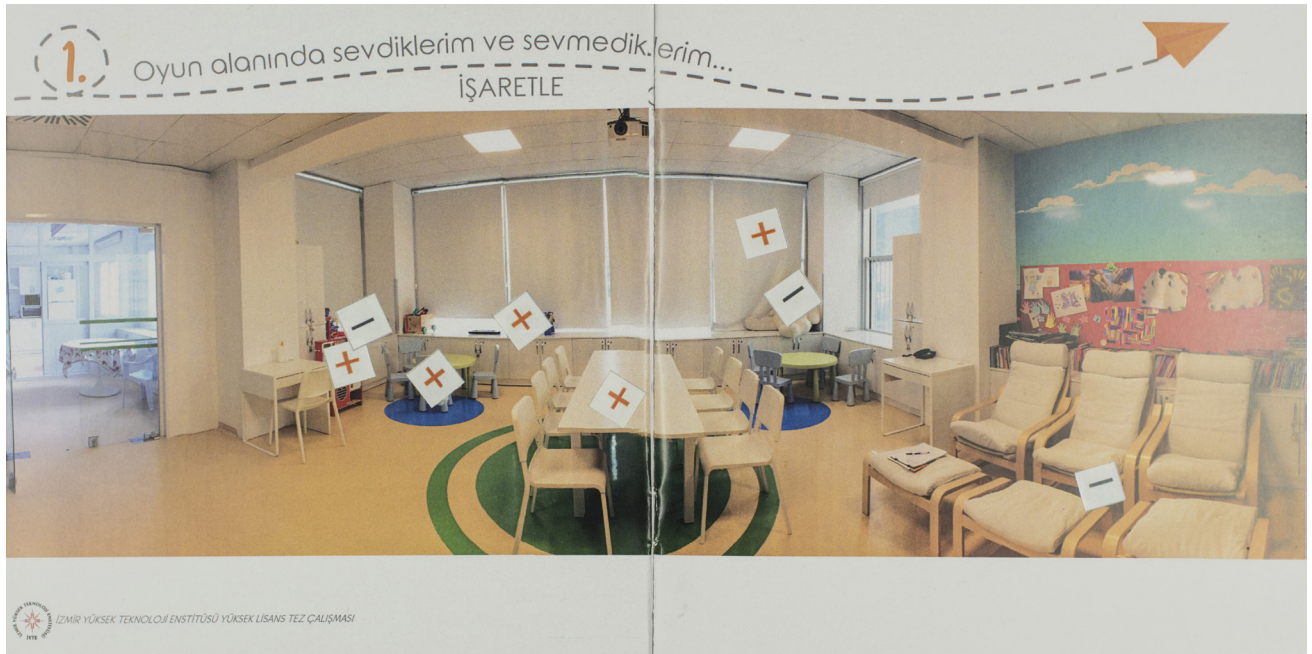


Figure 5. A page from Child 3's sensitizing workbook that was filled in with the help of the researcher at the beginning of the co-design session (photographed by the researcher)

with the researcher, they completed that part (**Figure 5**). Child 3 like other children also explained why he [dis]likes the furniture in the play area.

Child 3's idea throughout the co-design session was focused on designing furniture for playing chess in the play area (**Figure 6**). During one of the quick breaks, the child played chess with the researcher. While playing chess, he realized that a backrest was needed to prevent backache. He was also curious about other participants of this study: he fancied the opportunity to meet them. Child 3 was happy and said that time went by speedily during the co-design process. Furthermore, he disclosed that he was able to express himself better by "making" with the help of the Make toolkit.

The last meeting was held in his single-patient room. After filling out the questionnaires, a Certificate of Participation and a small magnetic chess set were given to him. Later, he played chess with the researcher (**Figure 7**). During the course of the game, he mentioned that it was convenient to have a small chess set to carry everywhere with him.

Co-design with Child 4

She is a 16-year-old girl diagnosed with cancer in 2017. They moved to Izmir for treatment but could not afford to live there. She has five siblings and her mother is pregnant. She is aware of the nature of her illness. Up until this year when she took a break, she had been going to school. Even though she felt energetic, she was not physically active. Her easygoing nature was evinced in how easily she makes friends in the hospital and how good her relations are, with nurses. Her sensitive nature makes her fond of emotional music. To feel better, she likes putting on make-up.

Although she was an adolescent her playful persona made the researcher give her the informal sensitizing workbook. She seems to have appreciated this more. With the consciousness of her illness in mind, her father was interviewed in the cafeteria since it was not very crowded. During the interview with her father, she offered a series of comments on some



Figure 6. Furniture design idea for playing chess generated by Child 3 during the co-design session (Photography: Ersan Çeliktaş)



Figure 7. The small magnetic chess set was presented to Child 3 and they played chess with the researcher

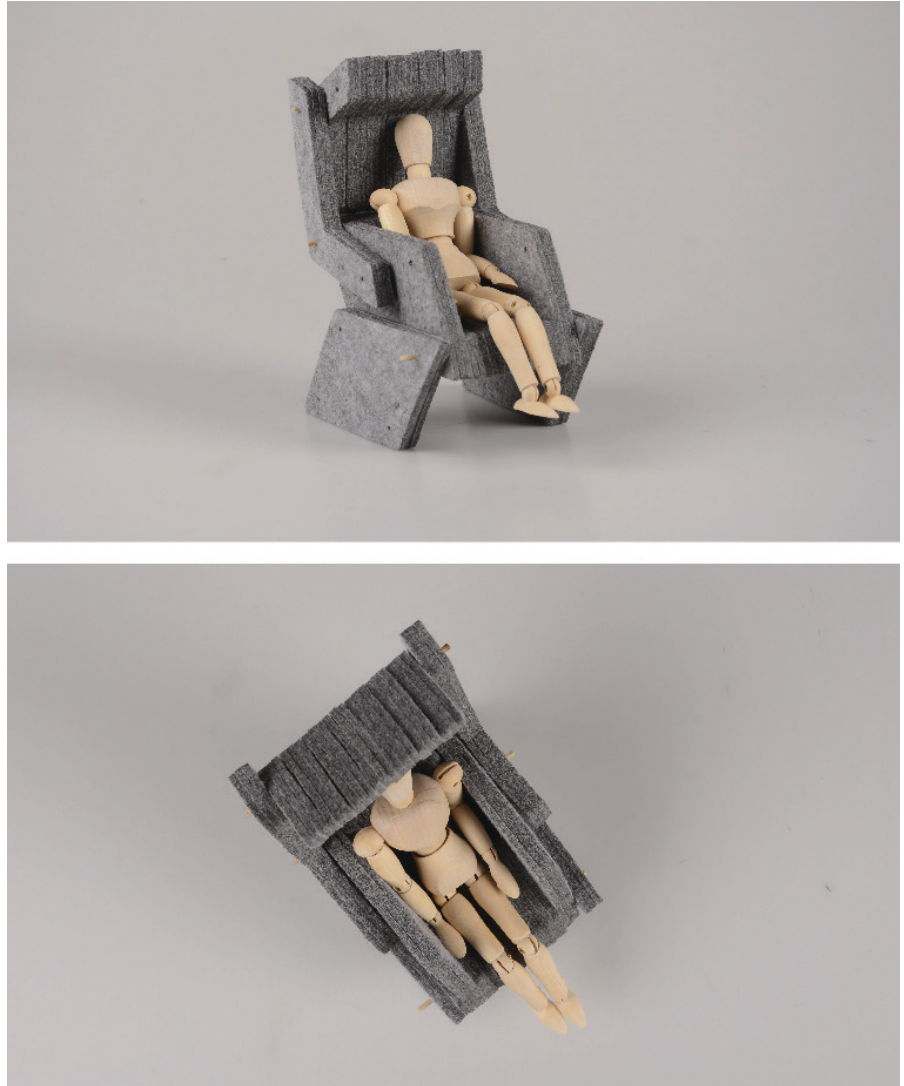


Figure 8. Furniture design idea generated by Child 4 during the co-design session (Photography: Ersan Çeliktaş)

questions. For the co-design session, she came to the play area together with her father but while coming, she forgot to bring the workbook. Her furniture design idea for the play area was a seating unit (**Figure 8**) that can be enclosed to guarantee privacy while listening to music. She also noted that she likes to be alone sometimes but that was impossible to achieve in the hospital and its environs. To smother any tension and make the child comfortable during the co-design session, they listened to her favorite songs. While the session was on, she received and spoke on the phone informing the other party that she was playing in the play area. In the last meeting, they filled out the questionnaire. Child 4 and her father were presented with the Certificate of Participation and a small magnetic chess.

Co-design with Child 5

Child 5 is a 17-year-old boy diagnosed with cancer in the bones located in his shoulder, in 2018. He does not hail from Izmir so when he is not hospitalized, he lives with his aunt. The severity of his illness necessitated that he puts on hold his education for now and this makes him worried about his future. Although he used to do sports regularly, now he thinks his active sport days are behind him due to the surgery he had. He feels

upset when he is unable to take care of himself. His sociability helps him to make friends easily in the hospital. He is convinced that the play area at the hospital is only useful for younger children but not for him. As a result, he spends all of his time in the hospital on his phone. Unlike the other children, he finds the games in the play area too childish and prefers PlayStation.

Since he is a teenager aware of his illness, he opted to sit-in during the interview with his brother; he did and occasionally offered comments. His age made the researcher prepare and present to him a more 'formal' version of the sensitizing workbook with the same content.

Due to his blood test results, the next chemotherapy cycle was postponed so he had to stay with his aunt. In the meantime, the researcher offered to visit him at home but his aunt rejected for lack of familiarity with the researcher. The Child was upset by this. However, after two weeks, the co-design session was organized in the play area. Elaborating his answers on the sensitizing workbook revealed that he would like to organize PlayStation tournaments in the play area. Consequently, his furniture design idea consisted of two armchairs for the players and a pouf for other

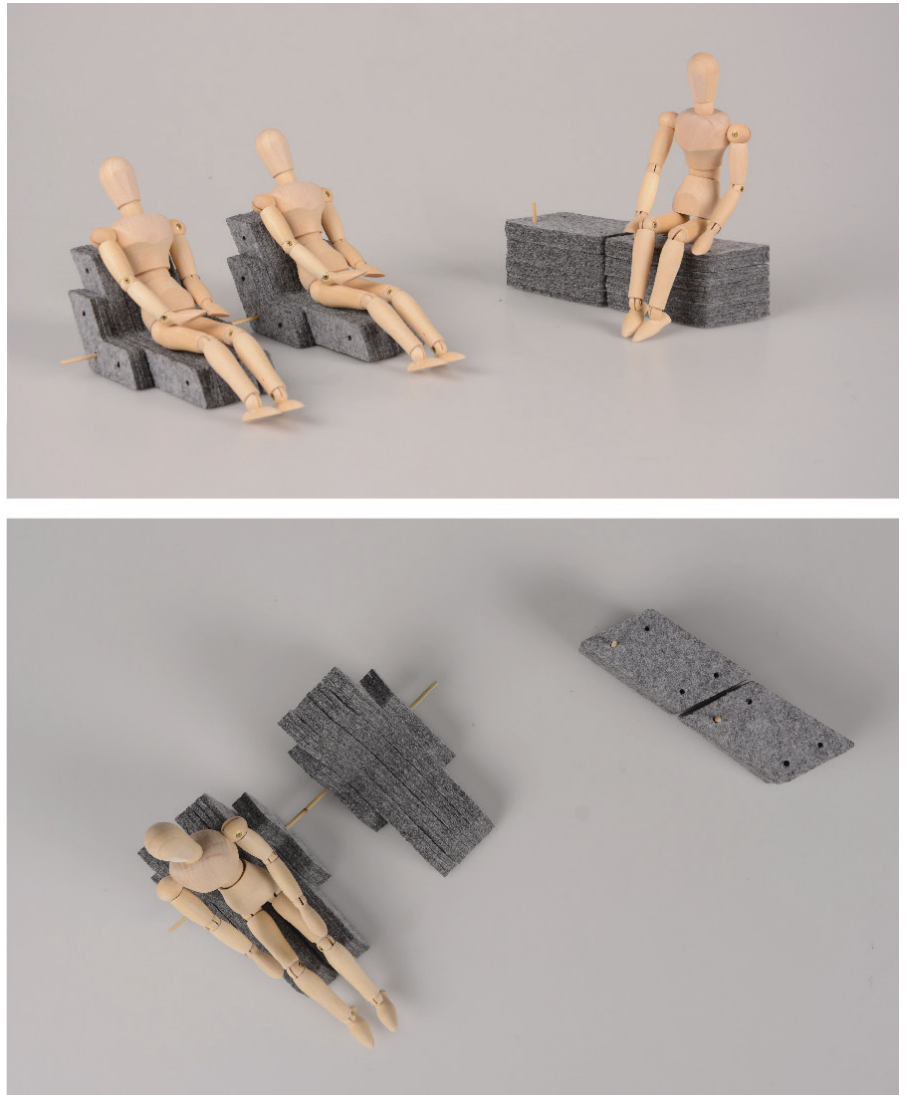


Figure 9. Furniture design ideas generated by Child 5 during the co-design session (Photography: Ersan Çeliktaş)

children while they await their turn (Figure 9). Lastly, after filling out the questionnaires, he received the Certificate of Participation and a small gift of a magnetic chess set.

Evaluation of the Co-design Process

From the questionnaires evaluated, four out of the five children chose “definitely agreed” and only one chose “agreed” as a response for Question 1 (Q1: Do you think that you felt better during this process when compared with the past?). Three out of the five children expressed that their general mood and attitude during the study was “very good” while only two opted for the “good” response to Question 2 (Q2: How would you describe your mood during the co-design process? Options: 1;very bad to 5;very good). It shows that the process has had a positive impact on children’s well-being and their perception of it. When asked to rank the activities they participated in (PedsQL, sensitizing workbook, co-design session) from the most to least enjoyable, four out of the five children revealed that the co-design session was “the most enjoyable” and playful stage. Three out of the five children considered the sensitizing workbook as “the least enjoyable” stage in the study. This addresses a need to redesign the sensitizing workbook (Q3: Which one of these stages was more enjoyable for you? (Please prioritize them). Lastly, results from the questionnaire revealed that all the children would participate in a co-design process if it was to be arranged again (Q4: Would you like to participate if a co-design session was

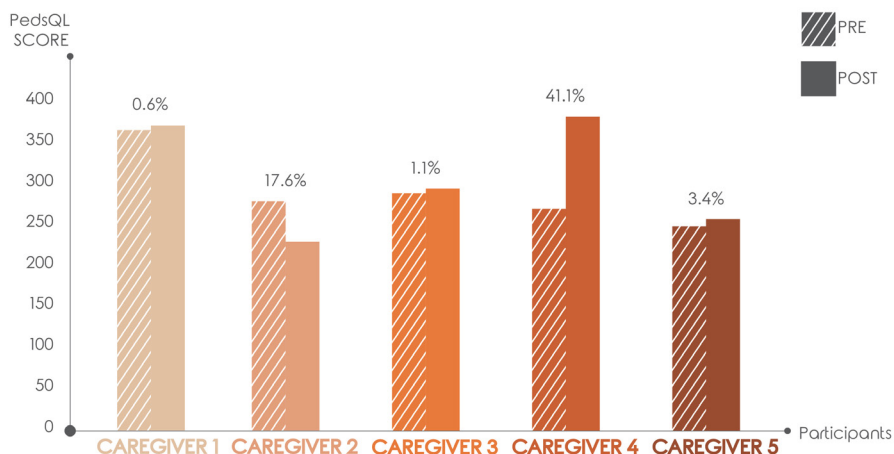
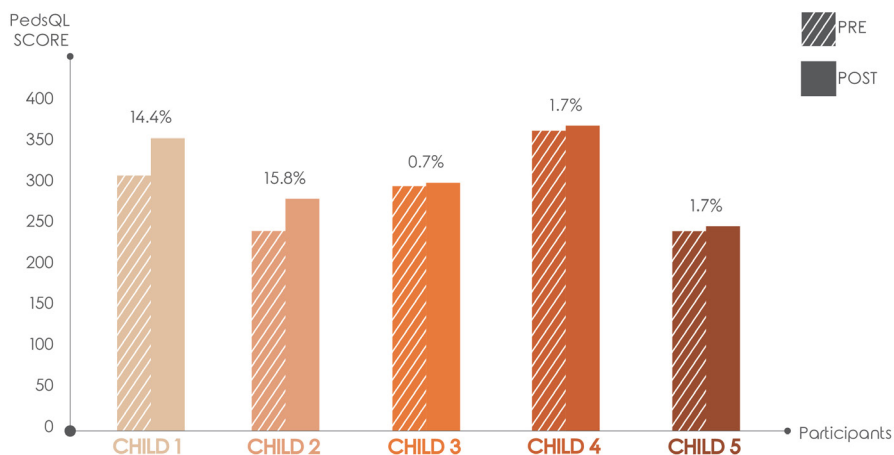


Figure 10. PedsQL pre-post comparison according to child reports (top) and proxy reports (bottom)

organized again?). In addition to the qualitative data gathered, quantitative data was also collected through the PedsQL questionnaires completed by the children and their caregivers both before and after the co-design process. Even though a caregiver indicated a decrease in their child's QOL (proxy report), the change ratio between pre and post PedsQL child reports showed that the QOL of all the children increased (**Figure 10**).

DISCUSSION AND CONCLUSION

The results of this study are divided into three: design recommendations for play areas for children with cancer in the hospital; recommendations for facilitators of the co-design sessions with children with cancer; and the possible positive impact of co-design sessions on the QOL of children with cancer.

This study has demonstrated that the indoor play area at the Oncology and Hematology Service of the hospital plays a crucial role in the lives of visiting children. The fact that most of the children are prevented from playing outside for the risk of infection underlines the importance of providing inpatient children with a play area that meets their needs.

Findings from the field suggest that design ideas generated by children can be associated with their needs, personalities and backgrounds (Table 1). The need of Child 1 conformed to his personal interests and hobbies. Moreover, he expressed his need to have access to nature in the play area. Additionally, using his ingenuity to create an imaginary world can otherwise be included among his needs. The TV couches of different sizes designed by Child 2 represent his personality as a social child. Furthermore, his tent design idea was obviously a portrayal of him trying to replicate in the play area of the hospital the feeling of warmth he derives from playing 'together' with his sisters. The furniture for playing chess design idea of Child 3 corresponds to his interests and demonstrates his need to socialize in the play area. Child 4's design idea – an enclosed seating unit that guarantees seclusion to listen to music – indicates her need for privacy at the hospital. Lastly, the seating unit designed by Child 5 might be linked to his needs for socialization and activities associated with older children.

The results of the co-design sessions showed that all the furniture design ideas generated by the children during the sessions varied and were based on subjective needs. The modules made of felt involved in the Make toolkit enabled them to create what they intend to see in the play area. From observation, the children enjoyed the design process with little modules to create furniture ideas. If they can create that furniture by assembling bigger modules in the play area, they can use them there and continue to be the design partners of an ever-changing play area altogether. Accordingly, designers of these spaces can consider using flexible, adaptable or modular furniture which can increase children's participation and satisfaction while designing a hospital play area. A modular furniture system may provide flexible opportunities for a wide age range thereby sidestepping the problem of age rigidity emphasized by the children during the co-design process. Children can use these modules on their own to create furniture for their specific needs. Since children often feel a lack of control ensuant from the uncertainty of their illness and unfamiliarity with hospital environments researchers (for example, Hilda et al., 2015) pointed out that adopting such creative possibilities might give the children some sense

Child	Age	Design Ideas Generated During the Co-design Sessions	Quotes	Keywords
1	7	A drawing chair with a rotatable part and an imaginary car (Figure 2)	"I would put this drawing chair in the corner near the window... I love to see what is going on outside and I like to draw what I see there."	*Imagination *Access to nature/ life outside
2	10	A swing, TV couches at different sizes, a tent to hide inside while playing (Figure 4)	"I love to play with my sister, putting pillows on top of each other and hiding under them."	*Togetherness
3	10	Furniture for playing chess (Figure 6)	"Actually, you should not think about it. Just focus on making. While you are making, the idea comes up."	*Socialization
4	16	A seating unit that provides privacy (Figure 8)	"I like listening to music very much especially when I am making something. For example, when I make scarves, I always listen to music."	*Privacy
5	17	Two armchairs for PlayStation tournament players and a seating unit for children waiting their turn (Figure 9)	"I feel like this play area is not suitable for me. If you ask me, there should be products that address everyone. However, it is not like that here. So, I always stay in my bed. I have never been to the play area."	*Socialization *Activities meant for older children

Table 1. Design ideas generated during the co-design sessions by the children and keywords extracted from the process in relation to the children's needs in the play area in the hospital

of control while in the hospital. "IKEA effect" (Norton et al., 2012) lends credence to the stance by explaining that children may value these products more than the ready-made ones since they invest their effort in creating and customizing them according to their needs and taste. Moreover, a modular furniture system in the play area can provide the children with an escape from monotony.

This study also provides suggestions to the facilitators of the co-design sessions with children with cancer. First, the observations and interviews were quite helpful in having more efficient co-design sessions with children. They allowed the researcher to get to know the children better and create activities accordingly. For instance, although the color of a pencil might seem like a trivial detail, it matters to some children. Moreover, the pre-meetings with children proved useful in improving children's familiarity with the researcher, thus contributing to the effectiveness of co-design. Also, it might be better to conduct one-on-one interviews with caregivers of the children since they may feel stressed by the presence of their children. In part, this also depends on other parameters such as the child's personality, knowledge of their illness and maturity. As far as the generative tools are concerned, the Make toolkit and the sensitizing workbook seemed to contribute to the process. Children expressed their needs in an easier way through making activities. However, for some children, the activities in the sensitizing workbook were not clear enough. For better clarity, it is advisable to co-design the generative tools including the sensitizing workbook and the Make toolkit with children. To achieve a higher level of communication with the children, it is advisable for facilitators to consider their age differences and interests. The role of caregivers during co-design cannot be overemphasized. Direct conversations between the researcher and caregivers enhanced communication during the process as such their support was constructive in the co-design process. To this end, it is strongly recommended that facilitators of co-design processes have a close communication with family members of the participating children to increase the effectiveness of the sessions and avoid situations that might lead to unintended problems like disagreements between children and their family members. Actively

involving caregivers in co-design sessions was also beneficial for the efficiency of the session. Even when they were not too active, the children felt more comfortable in their presence. Their contribution was valuable as they reflected their point of view and opened new conversations with children. It was learned that children might need to be given the freedom to tailor the co-design session according to their tastes and this requires flexibility/adaptability by the facilitator. For instance, listening to music during the session – if they find it more enjoyable and comfortable – can only increase the efficiency and effectiveness of idea generation. This means that not only the outcome of the co-design session but also the process itself can be co-designed with the participants.

Furthermore, the study found that involving children with cancer in co-design processes might contribute to their QOL for several reasons. First, as a democratizing activity, the co-design processes might help children with cancer experience a sense of accomplishment and control over their environment (Robertson and Simonsen, 2012). Pertinent literature underscores that children often feel in control when their ideas are sought regarding an issue that concerns them (Sanoff, 1988). Correspondingly, the participating children in this study appreciated that their ideas were sought throughout. Second, during the co-design sessions, children can socialize with the facilitator and other stakeholders. As clearly stated by the children during the co-design processes, one of the most fundamental needs of children with cancer concerns socialization issues. Third, the co-design sessions might provide a distraction from illness-related negative thoughts. For instance, it was seen that children perceive the co-design sessions as a playful activity. Furthermore, according to the observations and interviews with the children, their caregivers, doctors and nurse, children with cancer generally spend most of their time in their hospital beds. With the Make toolkit, children can create models themselves thereby becoming more physically active. Moreover, results from the questionnaires and PedsQL evaluated addressed a link between the QOL of children and the co-design process. However, due to the limited number of participants – a slight increase in most cases (child report) and a decrease in one case (proxy report) – the results cannot be seen as concrete evidence. Nonetheless, this study hopes that this might imply the potential health-related benefits of the co-design sessions and therefore inspire researchers to conduct comprehensive studies on that in a larger time span and with more participants.

In conclusion, even though this study does not claim to be exhaustive insights into the needs of children with cancer regarding the design of play areas in hospitals to aid healthcare workers were provided. Moreover, a link between QOL and the co-design processes has been presented. With suggestions provided for facilitators of co-design sessions, this study hopes it functions as a reference and also encourages more researchers to actively involve children with cancer in co-design processes rather than merely designing for them.

ACKNOWLEDGMENTS

We are thankful to Dokuz Eylül University Nevvar and Salih İşgören Children's Hospital for the chance to conduct this study. We are deeply grateful to all children and their caregivers for participating in this study. Special thanks are extended to the nurse Ayşe Örel and the doctors Prof. Dr. Dilek İnce, Prof. Dr. Şebnem Yılmaz and Prof. Dr. Hatice Nur Olgun for their guidance.

REFERENCES

- BARKER, J., WELLER, S. (2003) "Is it fun?" Developing Children Centred Research Methods, *International Journal of Sociology and Social Policy* 23 (1/2) 33-58.
- BOON, B., ROZENDAAL, M., VAN DEN HEUVEL-EIBRINK, M. M., VAN DER NET, J., STAPPERS, P. J. (2016) Playscapes: A Design Perspective on Young Children's Physical Play, *Proceedings of the 15th International Conference on Interaction Design and Children*; 181-9.
- BRYANT, P. (1974) *Perception and Understanding in Young Children: An Experimental Approach*, London: Methuen.
- CARVALHO E SOUSA, L., DE VITTA, A., DE LIMA, J. M., DE VITTA, F. C. F. (2015) The Act of Playing within the Hospital Context in the Vision of the Accompanying Persons of the Hospitalized Children, *Journal of Human Growth and Development* 25(1) 41-49.
- EVAN, E. E. (2014) Helping Sick Kids Be Kids, *A Parent's Guide to Enhancing Quality of Life in Children with Cancer*, eds. R. I. Hoffman, S. E. Smith, and MPH, American Childhood Cancer Organization, USA; 125-38.
- FAILS, J. A., GUHA, M. L., DRUIN, A. (2013) Methods and Techniques for Involving Children in the Design of New Technology for Children, *Foundations and Trends in Human-Computer Interaction* 6(2) 85-166.
- FAVARA-SCACCO, C., SMIRNE, G., SCHILIRO, G., DI CATALDO, A. (2001) Art Therapy as Support for Children with Leukemia During Painful Procedures, *Medical and Pediatric Oncology: The Official Journal of SIOP—International Society of Pediatric Oncology (Société Internationale d'Oncologie Pédiatrique)* 36 (4) 474-80.
- FELDER-PUIG, R, FREY, E., PROKSCH, K., VARNI, J. W., GADNER, H., TOPF, R. (2004). Validation of the German version of the Pediatric Quality of Life. *Quality of Life Research* 13 (1) 223-234.
- FLICK, U. (2018) *An Introduction to Qualitative Research*. London: Sage.
- WEAVER, K., GROVES, J. (2007) Fundamental Aspects of Play in Hospital, *Fundamental Aspects of Children's and Young People's Nursing Procedures*, eds. A. Glasper, M. Aylott, G. Prudhoe, Quay Books Division, London; 71-87.
- GRUNDY, C., PEMBERTON, L., MORRIS, R. (2012) Characters as Agents for the Co-design Process, *Proceedings of the 11th International Conference on Interaction Design and Children*, Bremen, Germany; 180-3.
- HANINGTON, B. (2003) Methods in the Making: A Perspective on the State of Human Research in Design, *Design Issues* 19 (4) 9-18.
- HANINGTON, B. M. (2010). Relevant and Rigorous: Human-Centered Research and Design Education, *Design Issues* 26 (3) 18-26.
- HENDRIKS, N., DREESSEN, K., SCHOFFELEN, J. (2016) Anchoring and Transcendence: PD as an 'Enabler' in Quality of Life. *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops-Volume 2*; 37-40.
- HILDA, H., LUBIS, B., HAKIMI, H., SIREGAR, O. R. (2015) Quality of Life in Children with Cancer and their Normal Siblings, *Paediatr Indones* 55 (5) 243-7.

- HORSTMAN, M., ALDISS, S., RICHARDSON, A., GIBSON, F. (2008) Methodological Issues When Using the Draw and Write Technique with Children Aged 6 to 12, *Qualitative Health Research* 18 (7) 1001-11.
- KABAK, V. Y., YAKUT, Y., ÇETİN, M., DÜĞER, T. (2016). Reliability and Validity of the Turkish Version of the PedsQL 3.0 Cancer Module for 2- to 7-Year-Old and the PedsQL 4.0 Generic Core Scales for 5- to 7-Year-Old: The Hacettepe University Experience, *Turkish Journal of Hematology* 33 (3) 236-243.
- KELLETT, M. (2009) Children and Young People's Participation, *Children and Young People's Worlds: Developing Frameworks for Integrated Practice*, eds. H. Montgomery, M. Kellett, Bristol: Policy Press; 43-60.
- KIRK, S. (2007) Methodological and Ethical Issues in Conducting Qualitative Research with Children and Young People: A Literature Review, *International Journal of Nursing Studies* 1250-60.
- LERNER, R. M. (2002) *Concepts and theories of human development*. Mahwah, New Jersey, USA; Lawrence Erlbaum Associates.
- LINDBERG, S. (2013a) Participatory Design Workshops with Children with Cancer: Lessons Learned, *Proceedings of the 12th International Conference on Interaction Design and Children*, New York, USA; 332-5.
- LINDBERG, S. (2013b) Properties of Participatory Approaches for Designing with Children in a Health Related Context, *Selected Papers of the Information Systems Research Seminar in Scandinavia*, Oslo: IRIS & Akademika forlag; 153-66.
- MATEUS-BERR, R., BRUNMAIR, B., HLAVACS, H., KAYALI, F., KUCZWARA, J., LAWITSCHKA, A., ... SPRUNG, M. (2015) Co-Designing Avatars for Children with Cancer, *Proceedings of the 3rd International Conference for Design Education Researchers LearnXDesign 4*, eds. R. VandeZande, E. Bohemia, I. Digranes, Aalto University School of Arts, Design and Architecture; 1398-413.
- MATTELMÄKI, T., VISSER, F. S. (2011) Lost in Co-X-Interpretations of Co-design and Co-creation, *Proceedings of IASDR'11, 4th World Conference on Design Research*, eds. N.F.M. Roozenburg, L.L. Chen, P.J. Stappers, Delft University, International Association of Societies of Design Research (IASDR).
- NAH, K. O., LEE, S. M. (2016) Actualizing Children's Participation in the Development of Outdoor Play Areas at an Early Childhood Institution, *Action Research* 14 (3) 335-51.
- NORTON, M. I., MOCHON, D., ARIELY, D. (2012) The IKEA Effect: When Labor Leads to Love, *Journal of Consumer Psychology* (22) 453-60.
- ÖRNEKOĞLU-SELÇUK, M., HASIRCI, D., TUNÇ-COX, A. (2022) Kanserle Mücadele Eden Çocuklarla Katılımcı Tasarım Sürecinde İletişim: Dokuz Eylül Üniversitesi Hastanesi Oyun Alanı Örneği, *Proceedings of the 5th National Design Research Conference UTAK 2022 Design and Pluralism*, eds. D. Tönük, G. Şen, Y. Bakırlioğlu, Faculty of Architecture, METU, Ankara; 341-61.
- PIAGET, J. (1995) *The Essential Piaget*, eds. H. E. Gruber, & J. J. Voneche, Northvale, New Jersey, London, Jason Aronson Inc.

- JOHNSON, M. P., BALLIE, J., THORUP, T., BROOKS, E., BROOKS, E. (2017) CO/Design: Building a Shared Dialogue around Analysis within Co-design, *The Design Journal* 20(sup1) S4241-S4252.
- ROBERTSON, T., SIMONSEN, J. (2012) Challenges and Opportunities in Contemporary Participatory Design, *Design Issues* 28(3) 3-9.
- RULAND, C. M., STARREN, J., VATNE, T. M. (2008) Participatory Design with Children in the Development of a Support System for Patient-centered Care in Pediatric Oncology, *Journal of Biomedical Informatics* 41(4) 624-35.
- SANDERS, E. B.-N. (1992) Converging Perspectives: Product Development Research for the 1990s, *Design Management Journal* 3(4) 49-54.
- SANDERS, E. B.-N., STAPPERS, P. J. (2012) *Convivial Toolbox: Generative Research for the Front End of Design*, Amsterdam, BIS.
- SANOFF, H. (1988) Participatory Design in Focus, *Architecture and Behavior* 4 (1) 27-42.
- SKIVENES, M., STRANDBU, A. (2006) A Child Perspective and Children's Participation, *Children, Youth and Environments* 16 (2) 10-27.
- SPIEL, K., BRULÉ, E., FRAUENBERGER, C., BAILLEY, G., FITZPATRICK, G. (2020) In the Details: the Micro-ethics of Negotiations and In-situ Judgements in Participatory Design with Marginalized Children, *CoDesign* 16 (1) 45-65.
- STEEN, M. (2013) Co-design as a Process of Joint Inquiry and Imagination, *Design Issues* 29(2) 16-28.
- VARNI, JAMES W., BURWINKLE, T. M., KATZ, E. R., MEESKE, K., DICKINSON, P. (2002) The PedsQL™ in Pediatric Cancer Reliability and Validity of the Pediatric Quality of Life Inventory™ Generic Core Scales, Multidimensional Fatigue Scale, and Cancer Module, *American Cancer Society* 94(7) 2090-106.
- WARREN, J. L. (2019) Exploring the Potential for Tangible Social Technologies for Childhood Cancer Patients within the Hospital, *Proceedings of the Thirteenth International Conference on Tangible, Embedded, and Embodied Interaction*; 733-6.

Alındı: 07.10.2021; Son Metin: 07.03.2023

Anahtar Sözcükler: Kanserle mücadele eden çocuklar; katılımcı tasarım süreci; çocuk hastanesi; oyun alanı; modülerlik

KANSERLE MÜCADELE EDEN ÇOCUKLARLA KATILIMCI TASARIM: SÖYLEDİKLERİNDEN, ÜRETTİKLERİNDEN VE YAPTIKLARINDAN İÇGÖRÜLER

Kanser teşhisi çocuklar için travmatik ve hayatlarını değiştiren bir olay olabilmektedir. Bu hastalığın teşhisi ve tedavi süreci çocukların acıyı deneyimlemesine, okul ve oyun aktivitelerinin kesintiye uğramasına, sosyalleştikleri ve alışkın oldukları ortamlardan ayrı düşmelerine neden olmaktadır. Tüm bunlar çocukların hayat kalitesini olumsuz yönde etkilemektedir. Bu makale, kanserle mücadele eden çocukların yaşam kalitelerini iyileştirebilecek tasarım önerileri sunabilmek için hastanedeki oyun alanı mobilyaları ile ilgili ihtiyaçlarına ışık tutmak adına onlarla yürütülen bir katılımcı tasarım sürecini konu almaktadır. Sonuçlar,

çocuklar tarafından kişiselleştirilebilen modüler bir mobilya sisteminin, çeşitli yaş gruplarının ihtiyaçlarına uyarlanabilmesi sayesinde çocukların yaşam kalitelerine katkıda bulunabileceğini önermektedir. Ayrıca, katılımcı tasarım oturumları ile artan kontrol duygusu, sosyalleşme ve fiziksel etkinlikler aracılığıyla çocukların iyi olma hali arasında olası bir bağlantı vardır. Çocuklarla katılımcı tasarım oturumlarının kolaylaştırıcısı olan tasarımcılara, aile bireylerini katılımcı tasarım süreçlerine aktif olarak dahil etmeleri, üretici araçları ve süreci katılımcılarla birlikte tasarlamaları ve katılımcı tasarım oturumlarını şekillendirirken gözlemler ile sözlü görüşmeler yürütmeleri tavsiye edilmektedir. Bu çalışmanın bulgularının tasarımcılar, katılımcı tasarım süreç yürütücüleri ve sağlık çalışanları için faydalı olacağı beklenmektedir.

CO-DESIGN WITH CHILDREN WITH CANCER: INSIGHTS FROM WHAT THEY SAY, MAKE, AND DO

Being diagnosed with cancer is traumatic and life-changing for children. Due to the disease and treatment, children experience suffering, pain, interruption in school and playful activities, and separation from social and familiar environments. These negatively affect their quality of life (QOL). This article reports a co-design process conducted with children with cancer to shed light on their needs with regard to the play area furniture at the hospital to recommend design ideas that might improve children's QOL. The results have shown that a modular furniture system that can be customizable by children might contribute to their QOL – thanks to its adaptability to the needs of a wide range of age groups. In addition, there is a possible link between co-design sessions and children's well-being in terms of an increased sense of control, socialization and physical activities. For designers– who are the facilitators of co-design sessions with children– actively involving caregivers in co-design processes, co-designing the generative tools and the process with participants, and conducting observations and interviews to shape and complement the co-design sessions are advised. The findings of this study are expected to assist designers, co-design practitioners and healthcare members.

MELİS ÖRNEKOĞLU SELÇUK; B.Int.Arch., M.Sc.

Received her B.Int.Arch from Izmir University of Economics (2016), M.Sc. in Industrial Design from Izmir Institute of Technology (2019). She is a researcher in design.nexus research group and a PhD candidate at Ghent University (2021-ongoing). Her research interests are co-design, designers as facilitators and design education. Melis.OrnekogluSelcuk@UGent.be

DENİZ HASIRCI; B.F.A., M.F.A., PhD.

Born in Reading-England, PhD from Bilkent University, Interior Architecture and Environmental Design (2005). NCSU Fulbright scholar and studies environment-behavior and Turkish modern furniture. Coordinator of the DATUMM: Documenting and Archiving Turkish Modern Furniture project, she is a Professor at Izmir University of Economics and Head of Design Studies graduate program. deniz.hasirci@ieu.edu.tr

AYÇA TUNÇ COX, B.Sc, M.Sc. Ph.D

Received her BSc and MSc in film studies from Ege University, Communication Faculty (1997-2005). Earned her Ph.D degree in film studies from Media Arts Department, University of London, Royal Holloway College (2011). She is an associate professor and also the Vice Dean at the Faculty of Architecture, İzmir Institute of Technology. aycatunc@iyte.edu.tr

DIGITAL DOCUMENTATION OF THE CAPPADOCIA GATE AT KERKENES IN YOZGAT, TURKEY

Nilüfer BATURAYOĞLU YÖNEY^a, Scott BRANTING^b,
M. Çıngı SALMAN^c, Doğan TEKİN^d, Dominique LANGIS-
BARSETTI^e, Nurçe DÜZALAN SALMAN^c, Jessica ROBKIN^f

Received: 20.03.2022; Final Text: 02.02.2023

Keywords: Cappadocia Gate; Kerkenes; UAV photogrammetry; laser scan

INTRODUCTION: KERKENES AND CAPPADOCIA GATE

The Iron Age city on Kerkenes Dağı, near Şahmuratlı Village in Sorgun, Yozgat, Turkey (**Figure 1, 2**) is one of the largest settlements of its period in Central Anatolia. It was built as a single foundation c. 620 BCE to the east of the River Halys (*Kızılırmak*), presumably by a Phrygian ruler, and was destroyed by fire c. 550 BCE, presumably by Croesus of Lydia or Cyrus the Great of Persia during their struggle. The archaeological and architectural evidence points primarily to Phrygian influence with various other Anatolian and Near Eastern cultural connections. The first survey and short excavation campaign at the site in 1926-1928 was carried out by Hans Henning von der Osten and Erich Schmidt of the Oriental Institute of the University of Chicago (von der Osten, 1928, 1929; Schmidt, 1929). This brief field work dated the city as "post-Hittite", now described as Iron Age, and helped possibly identify it as Pteria, a city mentioned by Herodotus in the *Histories* (Herodotus, 2009, I.76; Przeworski, 1929). A new campaign began in 1993 under the direction of Geoffrey D. and M. E. Françoise Summers with the support of the British Archaeological Institute at Ankara (BIAA) and Middle East Technical University (METU). This project became an experimental ground for state-of-the-art and non-destructive methods, using a range of new technologies, including aerial remote sensing, geophysical survey and digital photogrammetry. The documentation of the 271 ha urban settlement, including c. 750 urban blocks and surrounded by c. 7 km of walls pierced with seven gates, has been a work in progress, evolving with the development of new techniques and technologies for the last 30 years (Baturayoğlu Yöney *et al.*, 2002; Summers and Summers, 2010; Baturayoğlu Yöney, 2021).

The defensive circuit around Kerkenes is of a single build and formed of a dry-stone masonry wall with protruding towers and buttresses. It is clad with a stone glacis on the outside, and topped by a stone superstructure. There are no outworks or internal walls. The system makes efficient use of

a. *Corresponding Author*; University of Central Florida, Orlando, USA.

b. University of Central Florida, Orlando, USA.

c. Rekare Architecture, Istanbul, TÜRKİYE.

d. Zemastek, Istanbul, TÜRKİYE.

e. University of Toronto, Toronto, CANADA.

f. University of Central Florida, Orlando, USA.

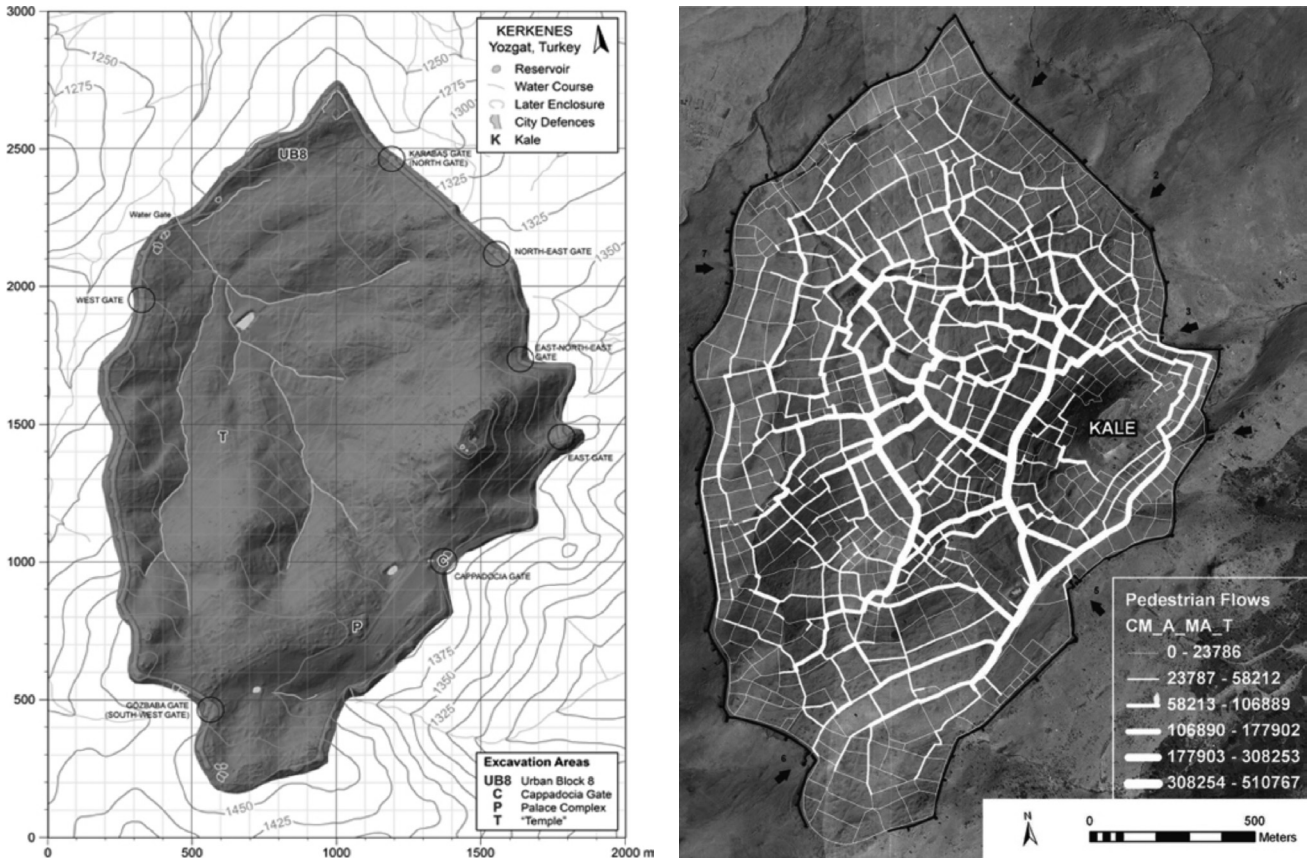


Figure 1. Plan of the archaeological site on Kerkenes Dağı. The excavated city gate – the Cappadocia Gate – (center right; C), the Palatial Complex (lower right; P), and the highest point of the site Kale (K). Urban Block 8 (top right; UB8) has been one of the study and excavation areas in recent years. (Map: Kerkenes Project)

Figure 2. Simulated traffic volumes of pedestrians on the street network at Kerkenes (Branting, 2007) clearly show the importance of the Cappadocia Gate (marked as level 5) in terms of the circulation in the city. It may be interpreted that it was the main gate among the seven entrance points. (Map: Kerkenes Project)

the existing topography; the walls follow the mountain ridge, and the individually planned gates are positioned at strategic points (Figure 3). The towers and buttresses are not located at regular intervals but rather at topographically weaker sections along the wall.

The material of the walls is crudely shaped granite, cut from extruded outcrops of bedrock on the mountain, making use of its natural fracture planes. There is a core of smaller rubble stones retained by wall faces of a “cyclopean” technique: a form of loosely fitted stonework of semi-shaped blocks stabilized with smaller chinking stones where necessary. Blocks vary in size with a limited attempt at coursing. The exterior wall faces appear to be formed of comparatively larger stones, while even larger flat stones were used to construct the glacis faces (Figure 4). The wall thickness is 5 ± 0.5 m with a height of c. 2 m on the interior side. The wall top may have been stepped where it descends steep slopes as indicated by the remains, and internal projections of 0.8-1.5 m may have been incorporated for ramps or stairways, none of which have survived. The towers along the wall and on either side of the gates were bonded with more carefully shaped prismatic stone blocks at the interior and exterior corners. The towers are generally 5-6 m in width and project some 10-12 m from the exterior face of the wall. These have not been placed regularly but rather at strategic and appropriate points where there is a rock-outcrop to form a base. The smaller buttresses generally protruding 2.5 m appear to be butted rather than bonded and might have been added later. Tumuli, shelters and animal pens constructed on top of the wall and tracks opened through the gateways in later periods obscure the original plan at many places, making interpretation more difficult. The amount of stone used for these later

1. For more detailed information about the construction system and characteristics of the wall, see Baturayoğlu Yöney (2021).

structures and the debris on either side of the wall indicates that there was a stone upper wall, perhaps narrower than the base and reaching several meters in height. However, no remnants of this upper wall have survived at any point along the 7 km long defenses. The walkways, their level(s) and the shape of the battlements are also unknown. The stone glacis encloses the visible exterior faces of the thick stone base, presenting a smooth and steep façade and making climbing up the wall more difficult for attackers. Its angle is around 60° but becomes steeper in rounded corners around sharp turns and towers (1).

Each one of the seven gates along the wall has been individually planned. Their locations relate to the position of routes leading to the city, the concerns of military strategy and the internal urban dynamics. The position, monumental appearance and strong defensive structure of the Cappadocia Gate (**Figure 1, C**), located on the high southeastern ridge of



Figure 3. The wall follows the ridge of the mountain, making use of the topography for defensive purposes. The debris of the wall itself obscures it in some sections. (Photograph: Kerkenes Project)

Figure 4. The glacis on the exterior side is built with large and flat stone blocks and reaches the top of the lower/base wall, which was c. 2 m high on the interior. The information concerning the upper wall is rather limited. (Photograph: Kerkenes Project)



the city where the line of the wall forms an elbow, identifies it as perhaps the most important one among them. It is located adjacent to major public zones, including water reservoirs, potential stables and the “Palatial Complex” (Figure 1, P. Summers, 2000; Summers, 2022). A study on the frequency of the use of streets inside the city (Figure 2) also supports this view (Branting, 2004; Branting, 2007; Branting et al., 2007). From the gate, a road descended down the hillside towards the Cappadocian Plain, facing Mount Argeus (*Erciyes*) in Kayseri. Considering the ancient trade routes and connections in Central Anatolia, this was perhaps the most frequently used gate with the heaviest traffic of caravans.

The asymmetrical plan of the gate, which is similar to the design of the other gates along the wall appears to reflect the topography. Formed of two parts on either side of the passage and chamber, it has been modified and partially obscured by collapse and subsequent clearance, the construction of tumuli, shepherds’ shelters and animal pens, and clearing of pathways for animals. The passage is about 6m in width and at least 25 m in length. An inner chamber is located on the northeastern side of the passage. On the exterior, there are twin towers on the east and a single tower on the west with single towers on either side of the interior. The city wall butts against the gate structure on either side, indicating that the gate was built before the adjoining walls. This may be true for other gates as well, supporting the view that the whole system was planned together and that the gates were laid out and constructed first. The exterior glacis, on the other hand, is continuous, showing that it was built last (Figure 5) (1).

The main body walls are vertical without steps or recesses between consecutive stone courses. The wall faces were probably constructed a course or two in advance of the rubble core to function as formwork. The building stones differ in size with larger stones located on the corners and lower courses and large prismatic blocks preferred on the tower corners. The wall and glacis face stones were not shaped but fitted, leaving relatively minimal gaps or joints. The larger of these were chinked with smaller stones in order to increase stability. Timber beams were located along the wall face; these were leveled and may have been partially hidden by smaller stones bonded with mud. No traces of vertical, diagonal, or cross beams perpendicular to the wall faces have been observed. The timber beams, about 20-25 cm in thickness, were spaced at 1 m intervals. However, the beams along the niches surrounding the chamber on the interior side are not quite parallel. The lowest beams are parallel to the inclined ground surface, and they gradually become level as the wall rises. None of the beams within the gate walls have been preserved. All were probably burnt during the massive fire that destroyed the city, with only scattered remnants of charcoal left in the cavities. The charcoal remnants have been identified as black pine (*Pinus nigra*), a coniferous tree still frequently found in Central Anatolia (2).

The doors were located in the back section of the passage, behind the chamber. There were two sets of doors with a small space between them, where a statue was located (Figure 5). This statue, of probably a female goddess, was set on a carved plinth and was hidden behind a mudbrick wall at a later phase (Figure 6, C). The doors were made of wood and held together with iron bands and nails, some of which were recovered during the clearance of the chamber. In front of the outer set of doors, on the right side, there is a stepped altar, which was topped by a semi-ionic sculpture (Figure 6, A). There was another aniconic stele at the interior

2. For more detailed information about the construction system and characteristics of the gate, see Baturayoğlu Yöney (2021).

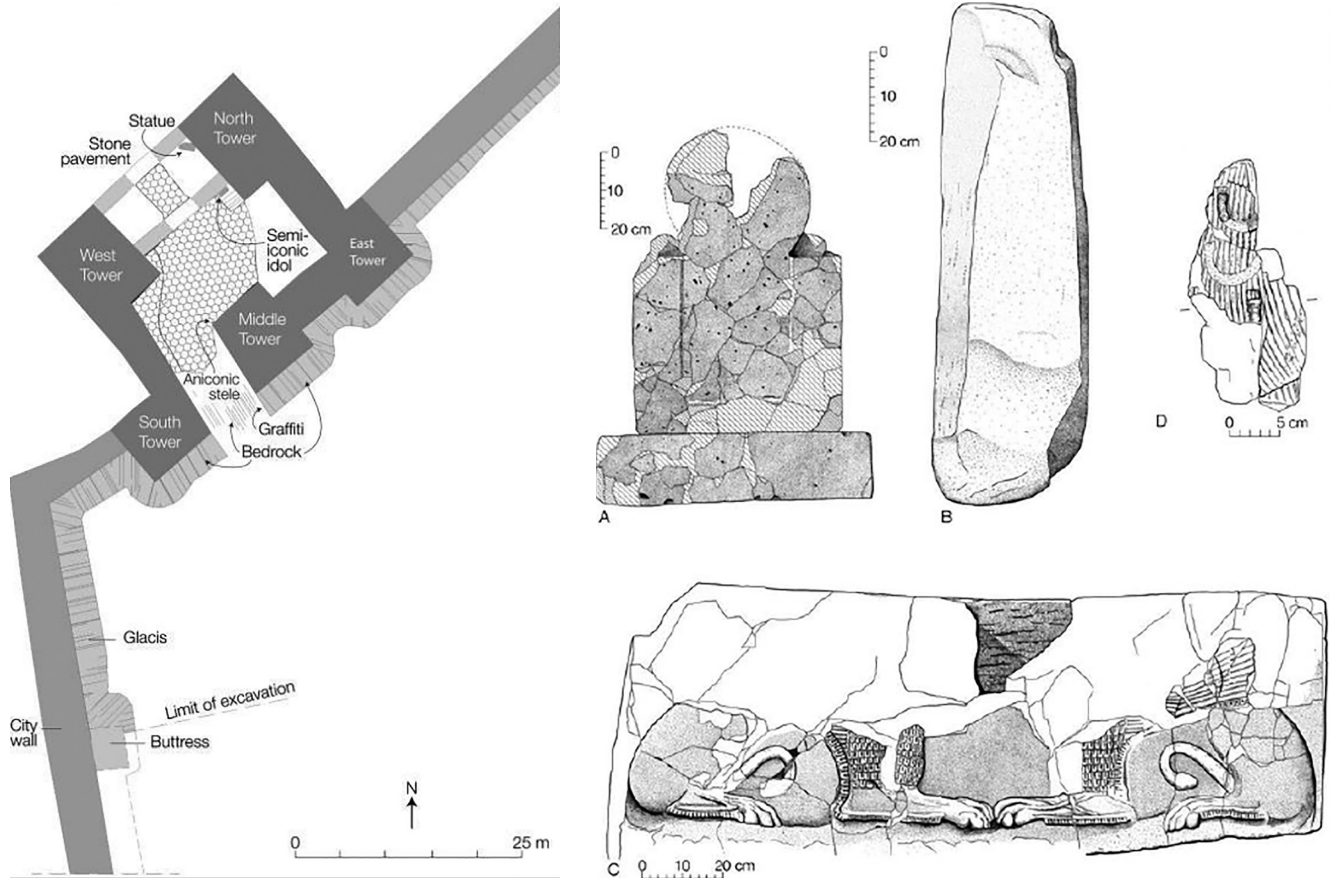


Figure 5. Block plan of the Cappadocia Gate, including features uncovered during the 2011 clearance (Osborne and Summers, 2014). (Image: Kerkenes Project)

Figure 6. Cultic images excavated within the Cappadocia Gate during the 2011 clearance: A) Semi-ionic idol (S1); B) Aniconic stele (S2); C) Statue base (S3); D) Statue fragment with Phrygian fibulae (drawings by Ben Claasz Cockson; Osborne and Summers, 2014). (Image: Kerkenes Project)

corner of the middle tower (Figure 6, B). Perhaps due to the difficulty of precision shaping the granite, several sandstone blocks were utilized at the corner of the middle tower. Similar sandstone blocks may have formed the battlements over the upper wall. A covered water channel runs along the length of the outer passage, which is more steeply inclined towards the outside. The pavements, channel, sculptures and other smaller artefacts, as well as two human skeletons, have been uncovered during the clearance of the gate (Summers et al., 2021, 55-7).

DOCUMENTATION HISTORY OF THE CITY WALLS AND CAPPADOCIA GATE AT KERKENES

H. H. von der Osten and F. H. Blackburn documented the walls during a short survey, lasting three days and 133 stations in 1927 (von der Osten, 1928; Figure 7). They named the southeastern gate the “Large Gate” (Figure 8). Carried out with a field theodolite, “the error of closure” as indicated on the map in the publication was 1.5x4 m, a feat of cartographical skill considering the size and difficult topography of the site as well as the time constraint of three days. However, more significant errors have been noted in the placement of excavation areas and features within the well-surveyed outer wall. When the new period of research began in 1993, the gates were named according to their position rather than being numbered. First called the Southeastern Gate, the monumental structure that forms the focus of this article later received the name Cappadocia Gate as it faces the large Central Anatolian plain of the same name.

Following a documentation based on aerial photographs and satellite images of the city, the entire area of the site, including each of the gates, was topographically surveyed using a post-processed configuration of four Trimble 4600LS GPS receivers in 1997-2001 by Scott Branting. 1,4 million data points were collected by mounting three of the receivers on project team members, the fourth functioning as a base station, and collecting topographic data points, with an attested accuracy of $\pm 10\text{-}25$ cm, every 2 seconds as they carried the receivers over the ground surface (Branting and Summers, 2002). The resulting point cloud allowed the generation of 3D models of the ground surface, including the area of the Cappadocia Gate (Baturayoğlu Yöney *et al.*, 2002; Baturayoğlu Yöney, 2002).

Also, in 1997 the city wall was surveyed with a total station at 1:200 scale by Nilüfer Baturayoğlu Yöney and two undergraduate students in architecture under the guidance of the former director G. D. Summers. The survey followed the wall faces visible on the surface through the rubble. External towers were usually less visible due to the spread of fallen rubble down the steeper external slopes. A total of seven gates were identified along the wall. An eighth structure, named the "Water Gate" is the strongly defended outlet of the stream that originates within the city and supplies fresh water to the settlement but it did not provide pedestrian or vehicular access



Figure 7. H. H. von der Osten and F. H. Blackburn's survey at Kerkenes in 1927 (von der Osten, 1928; p. 88, fig. 7).

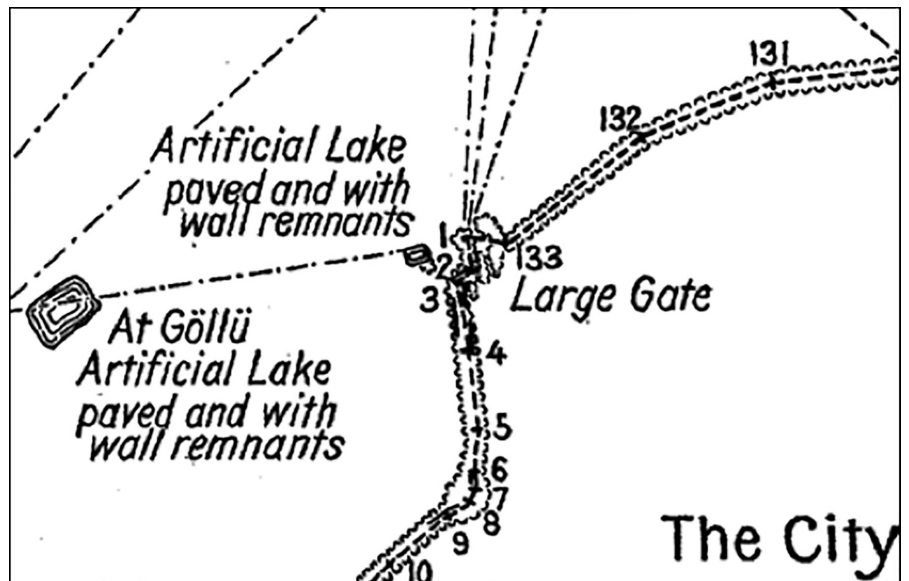


Figure 8. Detail showing Cappadocia Gate from H. H. von der Osten and F. H. Blackburn's survey at Kerkenes in 1927. The survey started and ended at the gate as indicated by stations 1 and 133 on either side (von der Osten, 1929; image cropped and enlarged from p. 20, fig. 11).

(Baturayođlu Yöney, 2002). Survey work also focused on the Cappadocia Gate. In addition to its comparative importance and size, it was selected because the visible parts, including stretches of wall and glacis together with the five towers that define the structure, suggested that it was perhaps better preserved. The survey and research not only aimed at determining the plan and construction system of the gate, but also at understanding the relationships between the bedrock, walls and glacis and determining the use of any other building materials in addition to local granite. Geophysical survey techniques used elsewhere at Kerkenes proved to be ineffective at the gate structures since they were covered with large amounts of collapsed granite rubble. Therefore, clearance and excavation were used for further investigation of the remains.

The first detailed plan of the Cappadocia Gate was drawn from a survey conducted during the 1997–2001 seasons by Ömür Harmanşah and Nilüfer Baturayođlu Yöney. This survey made use of the initial techniques applied at Kerkenes: previously produced balloon and blimp photographs were taken to the field for verification on the ground; points visible on the photographs that had been marked with white lime, together with features that could readily be identified on the ground, were plotted with a total station; and the photographs were digitized into CAD software. Following the clearance of the rubble on the outside of the gate structure in 1999 the glacis faces were documented as flat surfaces by Ömür Harmanşah. However, the complexity of the curvatures and inclinations resulting from the topography made it impossible to transform these detailed drawings into foreshortened architectural elevations. In 1999–2000 Kemal Gülcen of the METU Faculty of Architecture Graduate Program in Conservation of Cultural Heritage - Photogrammetry Laboratory prepared detailed façade drawings under the direction of Emre Madran using stereographic photogrammetry. A simple photogrammetry method based on single-image rectification was utilized for other wall faces and pavements (Baturayođlu Yöney, 2002; Baturayođlu Yöney, 2021; F. Summers et al., 2003).

In the 2009 season, architectural fieldwork focused on the documentation of the Cappadocia Gate once again to form the basis of a project for conservation, strengthening and enhancement for presentation and visitor security. The survey and documentation were carried out by M. Çıngı Salman, Erdoğan Cambaz and Nazlı Mavuşođlu with Nilüfer Baturayođlu Yöney acting as architectural preservation consultant. The documentation was approved by the concerned Regional Commission on the Conservation of Cultural and Natural Property in 2010. This new survey made it possible to draw the plans, sections and elevations of the gate structure, making it possible to understand how the walls were constructed on the existing bedrock and other topographical features.

The implementation of this ensuing conservation project, focusing on structural strengthening, visual enhancement and ensuring public safety, was carried out over two seasons with a grant provided by the United States Department of State Ambassador's Fund for Cultural Preservation and the support of the district governor and the mayor of Sorgun, Yozgat. Erkan Kambek acted as the field supervisor, while Nilüfer Baturayođlu Yöney was the consultant for the Kerkenes Team. In 2010, the glacis encircling the front of the middle and east towers was repaired and partially rebuilt to its original height, stabilizing the wall behind it, and the wall top was compacted. Unstable wall faces and fill on the interior

3. For more detailed information about the 2009-2011 survey and intervention to the Cappadocia Gate, see Baturayoğlu Yöney (2021).

4. Financial support for the ongoing monitoring and maintenance of the Cappadocia Gate by the current project was received from the Merops Foundation and the United States National Science Foundation (NSF) Senior Archaeology Grant Award #1624105. Funding was also received for the described ongoing augmented reality development by the United States National Endowment for the Humanities (NEH) Digital Humanities Advancement Grants HAA-256218 and HAA-277278. Rekare Architecture (Istanbul) carried out the field work and data processing.

sides of the middle tower were temporarily removed. In 2011, the interior faces of the north and west towers were dismantled and rebuilt using new timber beams. The interior face of the middle tower, which had completely collapsed during the winter, was dismantled, and the unstable wall faces and infill around the interior walls of the chamber were also temporarily removed. A similar intervention was carried out along the east side of the front gate passage as well (3). Following the retirement of G. D. Summers as project director in 2012, the work was suspended for several years.

Under the new project director, Scott Branting, the gate has been annually monitored and maintained since 2015 (4). Every year plants have been removed from the walls, the glacis, the gate passage and the chamber to minimize the impact that root activity might have on the integrity of the stone structure. At the same time, small chinking stones have been placed between the larger dry-laid stones of the walls and glacis to further minimize movement. In addition, c. 700 aerial photographs taken with a quadcopter (DJI 2s and 3s) combined with c. 300 ground-based photos of select walls and features within the gate have been collected every season since 2016. These photographs have been used to generate successive photogrammetric 3D models using Agisoft Metashape v. 1.2 to 1.7, previously called Photoscan (**Figures 9-10**). A typical model consists of up to 152,891,850 points within the generated dense cloud. The overall model error within Metashape has been sub-centimeter over the 7-year period, though some areas of specific models are less precise than this average. These annual models were overlain and compared from year to year within various versions of CloudCompare 2.x software in order to assess the displacements and deformations on the strengthened and untouched portions of the gate. The data collection and monitoring are carried out by Scott Branting, Dominique Langis-Barsetti and Jessica Robkin. Despite the annual monitoring and maintenance as well as the prior removal of unstable wall faces and infills during the conservation project in 2009-2011, partial collapses have occurred in various sections of the gate due to environmental conditions, such as heavy rainfall.

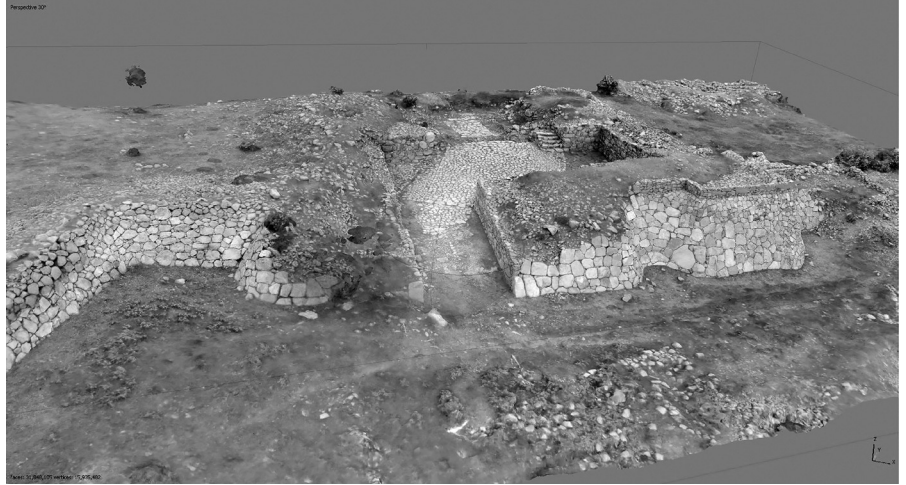
2019 SURVEY OF CAPPADOCIA GATE

In order to carry out another campaign of structural strengthening, restoration and partial rebuilding for the preservation and enhancement of the Cappadocia Gate, a new survey was carried out in 2019 by M.



Figure 9. Photogrammetric 3D UAV model of the Cappadocia Gate, showing the monument from the west. The image was produced by Scott Branting, Dominique Langis-Barsetti and Jessica Robkin in 2018. (Image: Kerkenes Project)

Figure 10. Photogrammetric 3D UAV model of the Cappadocia Gate, showing the monument from the south. The image was produced by Scott Branting, Dominique Langis-Barsetti and Jessica Robkin in 2018. (Image: Kerkenes Project)



Çıngı Salman and Doğan Tekin with Nilüfer Baturayoğlu Yöney acting as architectural preservation consultant for the Kerkenes Team. This survey utilized new methods and instruments of survey and was based on data collected with a 3D ground laser scanner. Its small size and lightness make it easy to use at sites like Kerkenes, where access is problematic due to rough topography and a lack of accessible roads.

The fieldwork, in this case, was completed in a single day. The data was then modified in order to form a coordinate system for drawings, and orthographic images were obtained at a scale of 2 mm/pixel (Figures 11-13). The methodology is explained in more detail below in Section 4. The CAD drawings were produced from these orthographic images (Figures 14-17).

Figure 11. Orthographic image of the Cappadocia Gate: South Elevation. The images were produced by M. Çıngı Salman, Doğan Tekin and Nurçe Düzalan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)



Figure 12. Orthographic image of the Cappadocia Gate: West Elevation of the Gate Passage. The images were produced by M. Çıngı Salman, Doğan Tekin and Nurçe Düzalan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)

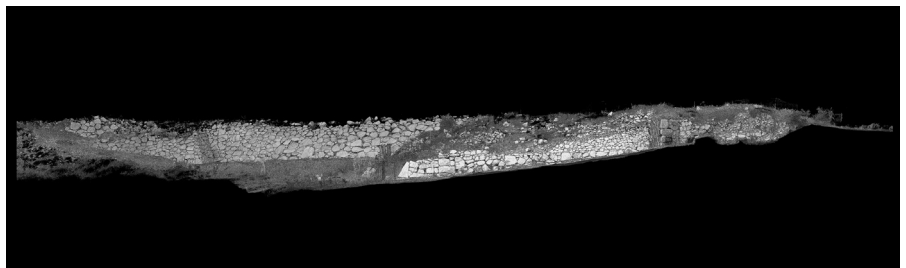
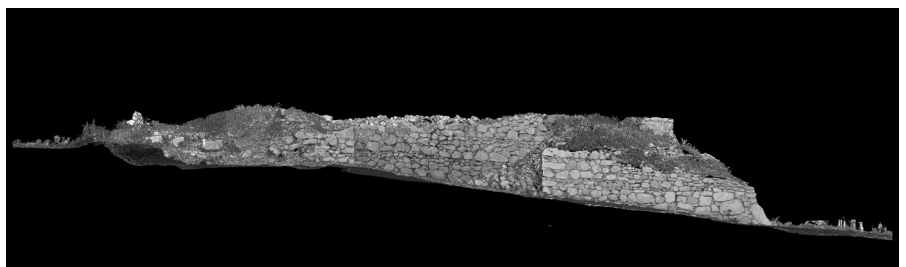


Figure 13. Orthographic image of the Cappadocia Gate: East Elevation of the Gate Passage. The images were produced by M. Çıngı Salman, Doğan Tekin and Nurçe Düzalan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)



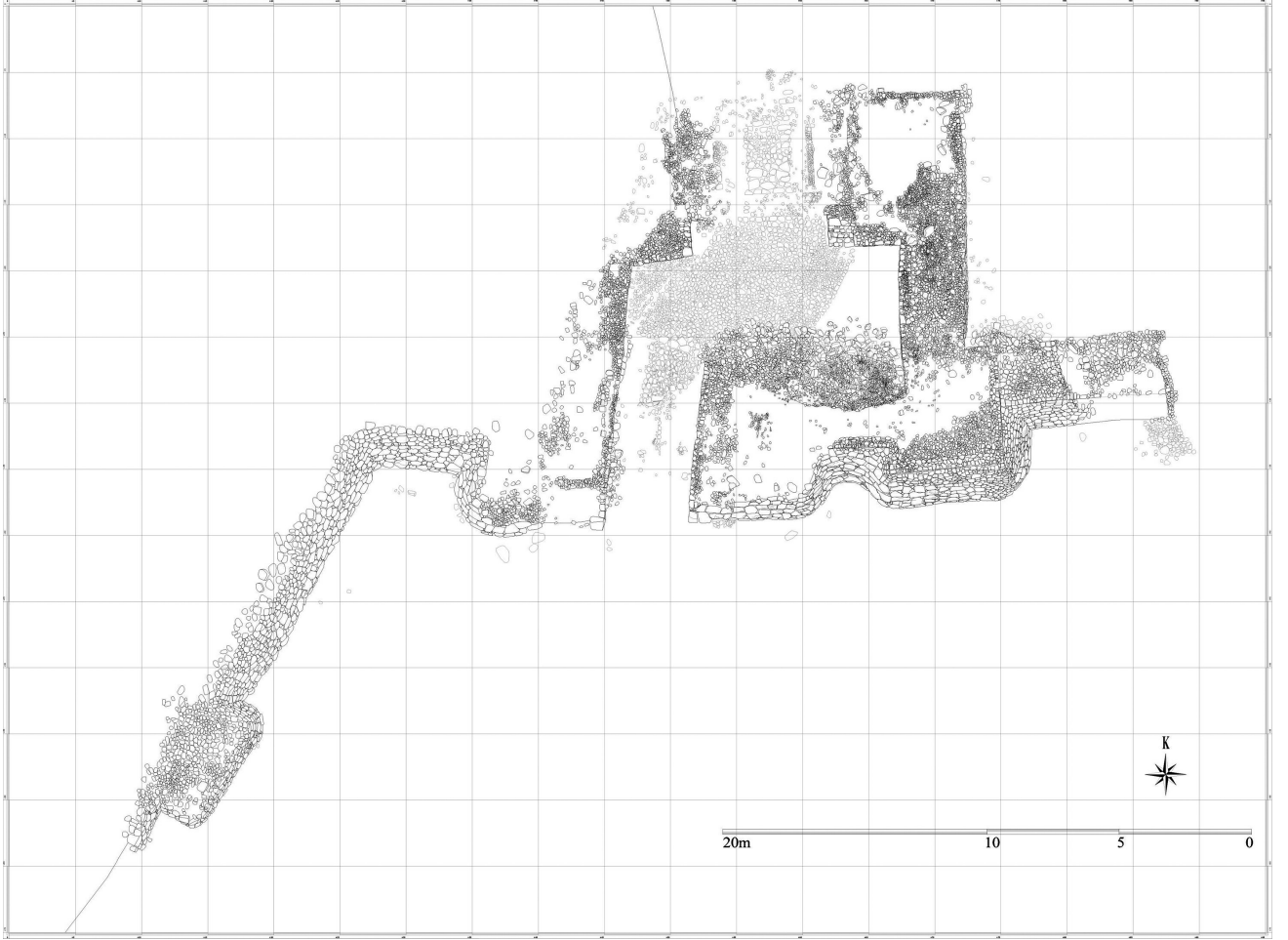


Figure 14. Plan of the Cappadocia Gate. The drawings were produced by M. Çingir Salman, Doğan Tekin and Nurçe Düzalan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)

A field-check was carried out, also in a single day, during the pandemic in 2021. The new structural strengthening and architectural conservation project will be based on this data and drawings and will be produced in 2023 by a multi-disciplinary team. Similar work at other cultural heritage sites around the world has demonstrated the efficacy of this approach (for example, Shanoer and Abed, 2018; Kushawa et al., 2020; Walters et al., 2020), though the uniqueness of the architecture in the Cappadocia Gate makes it a particularly interesting case.

A COMPARISON OF THE ARCHITECTURAL DOCUMENTATION METHODS APPLIED AT THE CAPPADOCIA GATE

The architectural documentation of the Cappadocia Gate in 2009 was carried out with a Leica TCR 407 total station. The frontal distance standard deviation of this instrument is 2 mm+2 ppm, and its angular precision is 7" (gradian seconds). According to the U.S. Institute of Building Documentation (USIBD) Document C120-C220 Specification (2016), the level of accuracy (LOA) of this survey and documentation was expected to be LOA20 (5 cm-15 mm). This data made it possible to draw the plans, sections and elevations of the gate structure at a scale of 1:50, based on a digital 3D model or point cloud formed from c. 2,000 survey points. It was possible to integrate all of the formerly produced wall face and ground surface drawings into this system and to construct accurate architectural

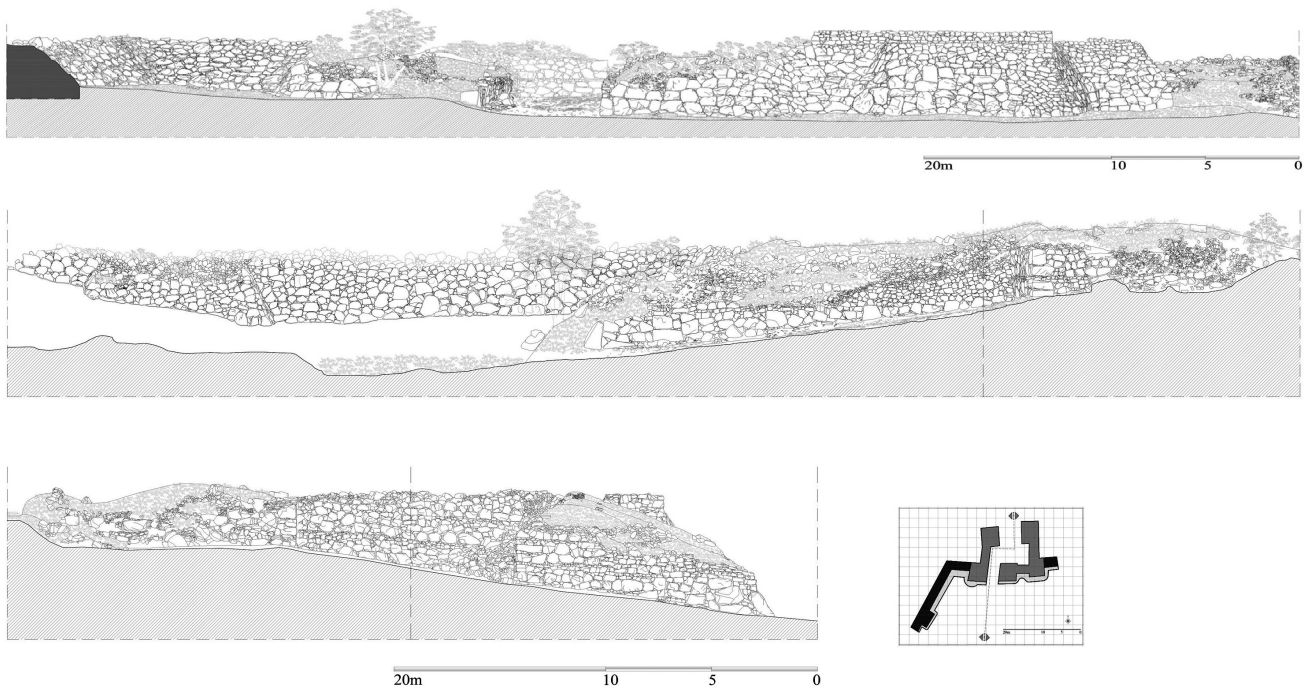


Figure 15. South (Exterior) Elevation of the Cappadocia Gate. The drawings were produced by M. Çingı Salman, Doğan Tekin and Nurçe Düzialan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)

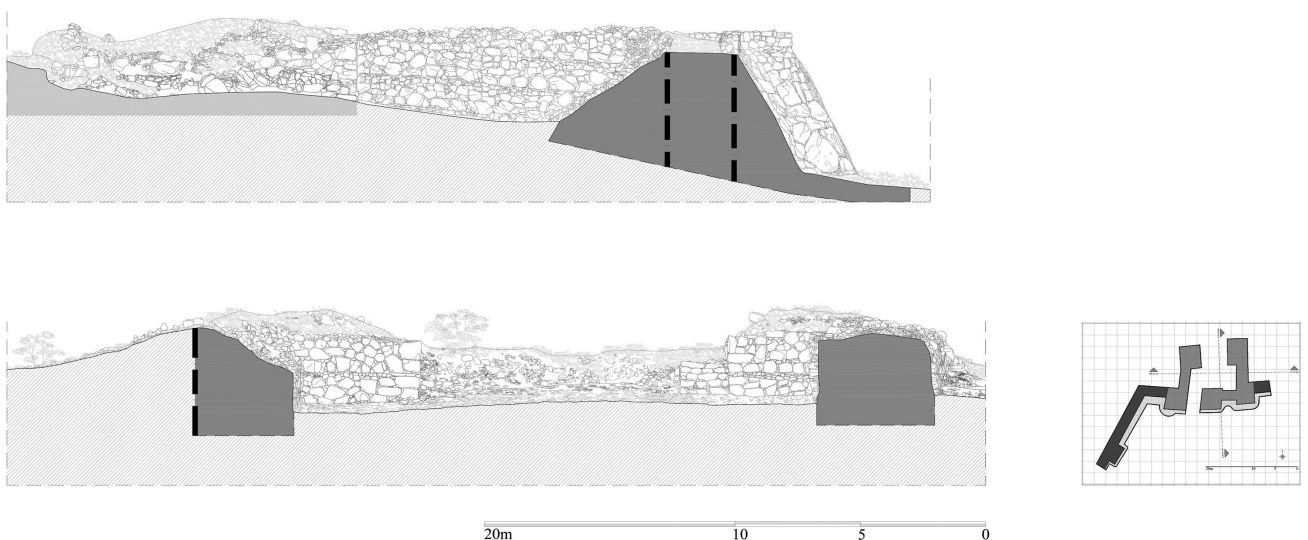
Figure 16. Sections through the Cappadocia Gate: West (top) and East (bottom) Elevations of the Gate Passage. The drawings were produced by M. Çingı Salman, Doğan Tekin and Nurçe Düzialan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)

Figure 17. Sections through the Cappadocia Gate: East (top) and North (bottom) Elevations of the Gate Chamber. The drawings were produced by M. Çingı Salman, Doğan Tekin and Nurçe Düzialan Salman from 3D laser scan data in 2019-2021. (Image: Kerkenes Project)

sections showing the relationship between the various parts of the structure, surfaces and sub-surfaces that had been revealed by clearance and excavation (**Figures 18-20**).

The documentation in 2019, on the other hand, was carried out with a Leica RTC 360 ground laser scanner. This instrument can measure 2 million points per second and collects data horizontally over 360° and vertically over 300°. Its three internal HD cameras can take 360° photographs at each scan station for coloring the point clouds. Its location precision is 1.9 mm per 10 m. It is controlled with a tablet, which may also be used for preview of the measurements and automated combination of the data collected. The data obtained at the different stations are then connected in Leica Cyclone software, creating a single 3D point cloud.

2D images and 3D models may be produced, using the 3D point clouds obtained with the ground laser scanner. The end product contains not



only visual information but also three-dimensional geometric data. The 360° instrumental scan and survey of the Cappadocia Gate in 2019 was carried out to produce the architectural documentation of the structure (**Figures 14-17**). Therefore, the instrument set-up points were chosen at the most favorable locations around the monument in order to reproduce a detailed digital model. The survey was carried out in high resolution (432 megapixels). During a single day of the survey, 21,782,388,897 points were collected at 89 stations. The combined data produced from different station points after bundle adjustment has a maximum error ratio (tolerance) or precision of 3 mm. Therefore, the level of accuracy (LOA) of this documentation is LOA40 (5 mm-1 mm).

The data collected through the 360° laser scanning was matched and aligned in the field and on the tablet using Leica Cyclone Field software. Cyclone software matches the data and images according to color and coordinate information and makes necessary data adjustments automatically. Then the data was transferred to the computer for levelling and further processing, also on Leica Cyclone software. The laser scans were first relatively combined, then “free levelling” and optimization was carried out. Each station’s data was also manually controlled with the data of another station, whose data overlaps with the first one.

Then the laser scan data was cleaned in detail on Leica Cyclone software. The data for those areas that would be used for plans, sections and elevations was selected from the clearest scans and combined in order to produce scaled orthophoto renders. These orthophotos with 3D coordinated data were combined into series following the coordinates and transferred to AutoCAD software for architectural drawing (**Figures 11-13**).

It has not been possible to carry out a comprehensive and integrated accuracy check between the surveys of 2009 and 2019 because excavation and clearance at the site continued through this period and there were no fixed coordinate points available. Some of the earth-covered areas in the 2009 total station survey have been cleared to expose wall faces, which were documented for the first time during the 2019 ground laser scan survey. Meanwhile, the strengthening work carried out at the monument with the purpose of stabilizing the exposed walls between 2009 and 2019, changed its appearance and the surrounding topography in part. In addition, it was observed that some of the drywall faces surveyed in 2009 were somewhat deformed and changed their location and coordinates.

In order to compare the surveys of 2009 and 2019, the plan and section drawings produced from the 2009 total station point cloud were juxtaposed and compared with the orthophotos produced from the 2019 ground laser scan data. The difference or deviation between the two data sets was identified to be max. 2 cm on wall faces (**Figures 18-20**). Therefore, the level of accuracy (LOA) of the 2009 total station documentation is proven to be LOA20 (5 cm-15 mm), and partially in the range of LOA30 (15 mm-5 mm). These standard evaluations are true for both measured and represented accuracy. Here, these values represent only the “shell” (superstructure and exterior vertical and horizontal enclosures) as the monument does not present any other building elements. LOA30 and LOA40 are both acceptable accuracies for heritage applications (USIBD C220, 2016).



Figure 18. Cappadocia Gate: The comparison of the plan produced from the 2009 total station point cloud (in red) and the combined orthophoto produced from the 2019 ground laser scan data. The image was produced by M. Çingir Salman, Doğan Tekin and Nurçe Düzialan Salman in 2022. (Image: Kerkenes Project)

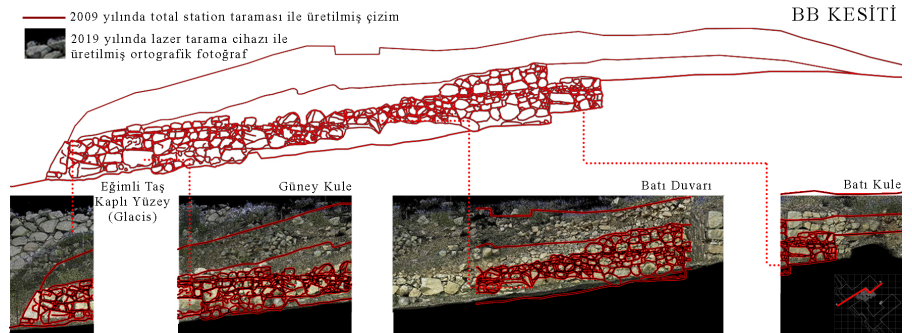


Figure 19. Cappadocia Gate: The comparison of the section through the Gate Passage showing its West Elevation produced from the 2009 total station point cloud (in red) and the combined orthophoto produced from the 2019 ground laser scan data. The image was produced by M. Çingir Salman, Doğan Tekin and Nurçe Düzialan Salman in 2022. (Image: Kerkenes Project)

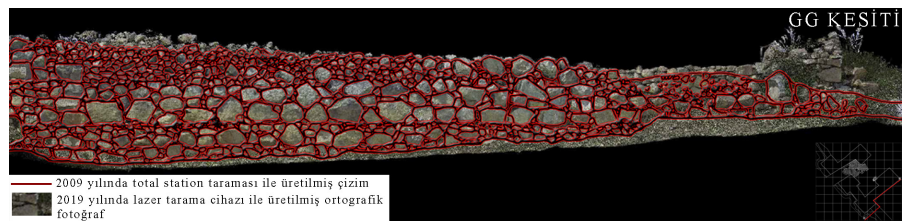


Figure 20. Cappadocia Gate: The comparison of the East Elevation produced from the 2009 total station point cloud (in red) and the combined orthophoto produced from the 2019 ground laser scan data. The image was produced by M. Çingir Salman, Doğan Tekin and Nurçe Düzialan Salman in 2022. (Image: Kerkenes Project)

CONCLUSIONS AND FUTURE RESEARCH

The survey, documentation, monitoring and preservation of the city wall and its gates, especially those of the Cappadocia Gate, have been challenging concerns since the beginning of the current research phase in 1993 (Baturayoğlu Yöney, 2021). One of the characteristics of the Kerkenes Project has been the constant use of contemporary and cutting-edge techniques and technologies. From aerial photographs to various models of total stations and photogrammetric equipment, the methods have evolved into UAV and laser scanner modelling in the recent years.

Beginning with the 1997-2001 surveys, each decade resulted in a new survey and documentation project for the city wall and Cappadocia Gate. Aerial images, total station points, hand drawings, stereographic photogrammetry and single image rectification were used in combination during the first documentation phases. The scale of the resulting data was adequate for 1:200 and 1:100 architectural drawings, which were used in publications accordingly (Baturayoğlu Yöney, 2002; Baturayoğlu Yöney, 2021; Osborne and Summers, 2014). The evolution of technologies made a second series of surveys for documenting the gate possible in 2009. The use of a reflectorless total station enabled reading of point data directly from the reflective surfaces of the granite blocks. The survey in 2009 enabled the rectification and accurate documentation of the wall faces and stone pavements (Baturayoğlu Yöney, 2021). Together with the former photogrammetry, this survey generated an integrated point cloud of the monument, from which the required 1:50 scaled drawings for the implementation of the structural strengthening and presentation project could be produced. The accuracy of this survey and documentation (measurement and representation) has been proven to be in the range of 2 cm (LOA20-30).

Following the suspension of the current phase of work between 2012 and 2014, the condition of the unmonitored monument, including partial collapses around the middle tower and the gate chamber, made a new survey and documentation phase necessary. This work was carried out in 2019-2020 with a 3D ground laser scanner, resulting in considerably more detail and reducing the length of the field-work to a single day. The point cloud model obtained from the c. 22 billion survey points, as opposed to the c. 2,000 collected in 2009 and the orthographic images produced from these, made a much more detailed and precise documentation possible. The accuracy of this survey and documentation (measurement and representation) has been proven to be in the range of 3 mm (LOA40), which is acceptable for heritage applications. The thirty-year comparison of documentation reflects the technical evolution in the field. The Kerkenes team has been able to continually utilize state-of-the-art methods and hopes to continue this tradition in the following years. Such applications of new technologies also provide younger team members with an opportunity to learn and practice in the field, especially through the formalized field school at Kerkenes that has been ongoing since 2016.

This is also vital for the structural analysis, monitoring and preservation of the monument. Annual monitoring has also become much easier with models developed from UAV images, also obtained in a single day in the field, and with comparisons of the 3D photogrammetric models it is possible to observe the stability of the structure and its movement. Such monitoring is fundamental for the upkeep of the unstable dry wall structure in order to avoid annual collapses due to movement. Building Information Models applied to Heritage (H-BIM) have become a common tool for collecting and disseminating data obtained in various categories of research as well as changes/deformations through time and interventions at various scales. Beyond their use for architectural documentation, the 3D models created through laser scans or with other survey methods, could also be used for H-BIM (Biagini et al., 2022). Thus, such models do not only serve architects but also cultural heritage specialists. The type of data integrated and disseminated may even include intangible heritage elements. The Cultural Heritage Abstract Reference Model (CHARM) is one such tool developed in Europe and used in archaeological

applications. However, creating combined digital and conceptual models and datasets, as well as enabling semantic data traceability, is not an easy task (Giovannini, 2021). The future of the Kerkenes Project and the Cappadocia Gate, in terms of the sustainability of the research and the monument, would also depend on the creation and utilization of such models. This kind of tools are also valuable for integrating data produced at the site and elsewhere after the season is over, and enable the collaboration of international researchers from different backgrounds on the team from wherever they are. These models can also incorporate and provide a working space for architectural documentation and the creation of reinstatement or hypothetical reconstruction proposals based on digital and semantic datasets, facilitating the life-cycle management of the monument.

Beyond research, maintenance and conservation, simplified 3D models may also be a useful tool for the promotion, interpretation and understanding of archaeological remains. Augmented Reality (AR) and Virtual Reality (VR) models of the Cappadocia Gate, or other structures at the site, could be used to enhance visitor experiences, for education and information dissemination purposes (4). Audiences of different ages and interests may experience the model of the remains and/or a virtual reconstruction both at the site or online. The Kerkenes Team is already working on such models and hopes to make these available to the public in the near future.

Therefore, survey and documentation with new and emerging technologies is not an end in itself. In addition to the field-school, these activities are aimed at providing the best possible understanding of the monument and the best solutions to its unique preservation problems. Going forward, the project will continue to utilize new and emerging technologies in order to better undertake the preservation of the Cappadocia Gate. This job, in itself, presents another interesting and evolving challenge. The structural integrity of the gate in antiquity relied on the leveling beams that supported the wall faces. They were burnt down to scattered bits of charcoal during the final fire that destroyed the city, and the subsequent years of exposure have only left behind horizontal cavities, which filled with small stones from the rubble core of the walls (Baturayoğlu Yöney, 2021). Without the support of the beams, or the support of the stone collapse, which filled the chamber and supported the wall faces for centuries, but was completely removed during the clearance in the 1997-2001 and the 2009-2011 seasons, it is only a matter of time before the elements and gravity completely bring down the unstable and outward leaning wall faces. It is only through constant monitoring, occasional rebuilding, and annual maintenance that we can hope to preserve this fragile monument. Therefore, the detailed documentation, monitoring and conservation efforts are all crucial elements necessary for the ongoing preservation of the Cappadocia Gate and the other structures with similar architectural characteristics at Kerkenes.

BIBLIOGRAPHY

- BATURAYOĞLU YÖNEY, N. (2002) The Survey and Documentation of the City Walls and Cappadocia Gate of the Iron Age Settlement on Kerkenes Dag in Central Anatolia, *Proceedings of the XVIII. International Symposium CIPA 2001 Surveying and Documentation of Historic Buildings – Monuments – Sites Traditional and Modern Methods*, ed. J. Albertz, CIPA, Berlin; 100-7.

- BATURAYOĞLU YÖNEY, N. (2021) Kerkenes Dağ Cappadocia Gate: Architectural Documentation, Conservation, and Environmental Control, *Kerkenes Final Reports 1. Excavations at the Cappadocia Gate*, ed. G.D. Summers, Chicago University Oriental Institute, Chicago; 44-54.
- BATURAYOĞLU YÖNEY, N., SUMMERS, G.D., SUMMERS, F., AYDIN, N. (2002) The Survey and Documentation of an Iron Age City in Central Anatolia: Kerkenes Dağ, *Proceedings of the XVIII. International Symposium CIPA 2001 Surveying and Documentation of Historic Buildings – Monuments – Sites Traditional and Modern Methods*, ed. J. Albertz, CIPA, Berlin; 407-14.
- BRANTING, S. (2004) *Iron Age Pedestrians at Kerkenes Dağ: An Archaeological GIS-T Approach to Movement and Transportation*, unpublished Ph.D. Dissertation, University at Buffalo, New York.
- BRANTING, S. (2007) Using an Urban Street Network and a PGIS-T Approach to Analyze Ancient Movement, *Digital Discovery. Exploring New Frontiers in Human Heritage. CAA2006. Computer Applications and Quantitative Methods in Archaeology. Proceedings of the 34th Conference*, eds. J.T. Clark, E.M. Hagemester, Archaeolingua, Budapest; 98-108.
- BRANTING, S., LEHNER, J., BALTALI-TIRPAN, S., GRAFF, S.R., MARSTON J.M., KALAYCI, T., ÖZARSLAN, Y., LANGIS-BARSETTI, D., PROCTOR, L., PAULSEN, P. (2017) The Kerkenes Project 2015-2016, *The Archaeology of Anatolia Volume II: Recent Discoveries (2015-2016)*, eds. S.R. Steadman, G. McMahon, Cambridge Scholars Publishing, Cambridge; 154-75.
- BRANTING, S., LEHNER, J. W., BALTALI-TIRPAN, S., LANGIS-BARSETTI, D., KALAYCI, T., GRAFF, S.R., PROCTOR, L., BATURAYOĞLU YÖNEY, N., ASILISKENDER, B., ÇAKIRLAR ODDENS, C., MARSTON, J. M. (2019) The Kerkenes Project 2017-2018, *The Archaeology of Anatolia Volume III: Recent Discoveries (2017-2018)*, eds. S. R. Steadman, G. McMahon, Cambridge Scholars Publishing, Newcastle upon Tyne; 99-111.
- BRANTING, S., SUMMERS, G.D. (2002) Modelling Terrain: The Global Positioning System (GPS) Survey at Kerkenes Dağ, Turkey, *Antiquity* 76(293) 639-40.
- BRANTING, S., WU, Y., SRIKRISHNAN, R., ALTAWHEEL, M.R. (2007) SHULGI: A Geospatial Tool for Modeling Human Movement and Interaction, *Proceedings of the Agent 2007 Conference on Complex Interaction and Social Emergence*, eds. M. North, D.D. Sallach, C. Macal, Argonne National Laboratory, Argonne; 475-87.
- BIAGINI, C. BONGINI, A., VERDIANI, G. (2022) From Geospatial Data to HBIM of Romanic Churches in Sardinia: Modelling, Check and Validation, *Architectural Graphics Volume 2 – Graphics for Knowledge and Production*, eds. M.A. Rodenas-Lopez, J. Calvo-Lopez, M. Salcedo-Galera, Springer Series in Design and Innovation 2, Springer, Switzerland; 368-78.
- GIOVANNINI, E.C. (2021) Data Modelling in Architecture: Digital Architectural Representations, *Representation Challenges: Augmented Reality and Artificial Intelligence in Cultural Heritage and Innovative Design Domain*, eds. A. Giordano, M. Russo, R. Spallone, Franco Angeli, Milan; 191-5.

- HERODOTUS (2009) *The Landmark Herodotus: The Histories*, ed. R.B. Strassler. Anchor Books, New York.
- KUSHWAHA, S.K.P., DAYAL, K.R., SACHCHIDANAND, RAGHAVENDRA, S., PANDE, H., TIWARI, P. S., AGRWAL, S., SRIVASTAVA, S.K. (2020) 3D Digital Documentation of a Cultural Heritage Site Using Terrestrial Laser Scanner – A Case Study, *Applications of Geomatics in Civil Engineering*, eds. J. Ghosh, I. da Silva, Springer, Singapore; 49-58.
- OSBORNE, J.F., SUMMERS, G.D. (2014) Visibility Graph Analysis and Monumentality in the Iron Age City at Kerkenes in Central Turkey, *Journal of Field Archaeology* 3(39) 292-309.
- PRZEWORSKI, S. (1929) Die Lage von Pteria, *Archiv Orientalní* 1(3) 312-5.
- SCHMIDT, E.F. (1929) Test Excavations in the City on Kerkenes Dagħ, *American Journal of Semitic Languages and Literatures* 45(4) 221-74.
- SHANOER, M.M., ABED, F.M. (2018) Evaluate 3D Laser Point Clouds Registration for Cultural Heritage Documentation, *The Egyptian Journal of Remote Sensing and Space Science* 21(3) 295-304.
- SUMMERS, F., ATALAN, N., AYDIN, N., BAŞAĞAÇ, Ö., UÇAR, G. (2003) Documentation of Archaeological Ruins and Standing Monuments Using Photo-Rectification and 3D Modeling, *Proceedings of the XIXth International Symposium CIPA 2003, New Perspectives to Save Cultural Heritage, Antakya (Turkey), 30 September – 04 October 2003*, ed. M.O. Altan, CIPA, Istanbul; 660-68.
- SUMMERS, G.D. (2000) The Median Empire Reconsidered: A View from Kerkenes Dağ, *Anatolian Studies* (50) 55-74.
- SUMMERS, G.D. (2022) *Kerkenes Final Reports 2. Excavations at the Palatial Complex*. Chicago University Oriental Institute, Chicago.
- SUMMERS, G.D., ERDAL, Y.S., BERNDT ERSÖZ, S., IOANNIDOU-PİŞKİN, E., ÖZARSLAN, Y., SUMMERS, F., TATE, R., BATURAYOĞLU YÖNEY, N., STRONACH, D. (2021) *Kerkenes Final Reports 1. Excavations at the Cappadocia Gate*, Chicago University Oriental Institute, Chicago.
- SUMMERS, G.D., SUMMERS, F. (2010) From Picks to Pixels: Eighty Years of Development in the Tools of Archaeological Exploration and Interpretation, 1927-2007, at Kerkenes Dağ in Central Turkey, *Proceedings of the 6th International Congress on the Archaeology of the Ancient Near East*, eds P. Matthiae, L. Romano, Harrassowitz, Wiesbaden; 669-83.
- USIBD (2016) *U.S. Institute of Building Documentation Level of Accuracy (LOA) Specification Guide*, Document C120 (v. 2.0), Guide for USIBD Document C220: Level of Accuracy (LOA) Specification for Building Documentation.
- VON DER OSTEN, H.H. (1928) An Unnoticed Ancient Metropolis in Asia Minor, *Geographical Review* 18(1) 83-92.
- VON DER OSTEN, H.H. (1929) *Explorations in Hittite Asia Minor, 1927-28 (OIC 6)*, University of Chicago Press, Chicago.
- WALTERS L.C., MICHLOWITZ, R.A., ADAMS, M.J. (2020) Using Laser Scans and 'Life History' to Remember Heritage in Virtual

Environments, *Virtual, Augmented and Mixed Reality. Industrial and Everyday Life Applications (HCII 2020)*, eds. J.Y.C. Chen, G. Fragomeni, Springer, Cham; 314-26.

Alındı: 20.03.2022; **Son Metin:** 02.02.2023

Anahtar Sözcükler: Kapadokya Kapısı; Kerkenes; İHA; fotogrametri; lazer tarama

TÜRKİYE, YOZGAT, KERKENES'DEKİ KAPADOKYA KAPISININ SAYISAL OLARAK BELGELENMESİ

Türkiye sınırları içinde Yozgat İli, Sorgun İlçesi, Şahmuratlı Köyü'nde bulunan Kerkenes, Orta Anadolu'daki en büyük Demir Çağı yerleşimlerinden biridir. 1926-1928 yıllarında H. H. von der Osten (Chicago Üniversitesi Yakın Doğu Araştırmaları Enstitüsü) başkanlığında gerçekleştirilen kısa süreli arazi çalışmasının ardından çağdaş araştırmalar 1993 yılından itibaren G. D. Summers (ODTÜ ve Ankara İngiliz Arkeoloji Enstitüsü) başkanlığında yürütülmüş olup, 2014 yılından beri yeni kazı başkanı (Scott Branting, Orta Florida Üniversitesi) tarafından sürdürülmektedir. Son 30 yılda Kerkenes Projesi, ileri ve kalıntılara zarar vermeyen arkeolojik araştırma ve belgeleme yöntem ve teknolojilerinin denendiği ve uygulandığı bir araştırma alanı olmuştur; bugüne dek kullanılan yöntemler arasında elektronik teodolit (*total station*), Küresel Konumlandırma Sistemi (GPS), insansız hava aracı (UAV) ve lazer-tarayıcı ile belgelemeye ek olarak, uydu ve hava fotogrametrisi ile jeofiziksel teknolojiler sayılabilir. 7 km uzunluğundaki şehir surları ve üzerindeki yedi kapının belgelenmesi ise geleneksel ve ileri yöntemleri bir arada kullanan ve halen devam eden zorlu bir süreçtir. Surların güneydoğu bölümünde yer alan gösterişli ve karmaşık bir yapı olan Kapadokya Kapısı, teknolojilerin evrimini izleyerek birden çok kez belgelenmiştir. Bu makale, bu eşsiz anıtın betimi ve araştırma tarihçesini takiben, mimari, taşıyıcı sistem ve yapı teknolojileri ve malzeme özellikleri konusundaki bilgilerimizin derinleşmesi ile birlikte belgeleme sürecinin nasıl evrildiğini aktarmakta, bugüne dek kullanılan farklı yöntemleri tartışarak karşılaştırmakta ve yapıda gelecekte gerçekleştirilecek belgeleme, izleme ve koruma çalışmalarına yönelik ipuçları sunmaktadır.

DIGITAL DOCUMENTATION OF THE CAPPADOCIA GATE AT KERKENES IN YOZGAT, TURKEY

Kerkenes, located at the Village of Şahmuratlı near Sorgun/Yozgat in Turkey, is one of the largest Iron Age settlements in Central Anatolia. Following a brief campaign in 1926-1928 by H. H. von der Osten of the Oriental Institute at the University of Chicago, contemporary research at the site began in 1993 under G. D. Summers (METU and British Institute of Archeology at Ankara) and continues under the current director (Scott Branting, University of Central Florida) since 2014. In the last 30 years, the project has become an experimental ground for state-of-the-art and non-destructive methods and technologies of archaeological research and documentation with methods ranging from total station, GPS, UAV and laser-scanner surveys to satellite and aerial photogrammetry and geophysical technologies. The survey of the 7 km city wall and its seven gates has been a challenging work-in-progress, incorporating both traditional and advanced methods. The Cappadocia Gate, a conspicuous

and complex structure on the southeastern section of the walls, has been documented several times as survey technologies evolved. This article provides a description and the research history of this unique monument. It summarizes the evolution of the documentation process with our understanding of its architectural, structural and technological/material characteristics, and discusses and compares the various methodologies that have been used, providing insights for future work on its survey, monitoring and preservation.

NİLÜFER BATURAYOĞLU YÖNEY; B.Arch, M.Sc., PhD.

Received her B.Arch in Architecture (1993) and M.Sc. in Architectural Preservation (1997) from Middle East Technical University Faculty of Architecture and her PhD. degree in Architectural Preservation from the Istanbul Technical University Faculty of Architecture (2008). Major research interests include architectural history and theory, and architectural documentation and preservation. nilufer.yoney@ucf.edu, nilufer.yoney@gmail.com

SCOTT BRANTING; B.A., M.A., M.A., PhD.

Received his B.A. in Archaeology and Near Eastern Archaeology from Wheaton College (1991), his M.A. in Near Eastern Languages and Civilizations from the University of Chicago (1996), his M.A. in Geography (2003) and his PhD. degree in Anthropology (2004) from the University at Buffalo. Major research interests include Iron Age Anatolia, geospatial sciences and simulation, and cultural heritage monitoring. scott.branting@ucf.edu

M. ÇINGI SALMAN; B.Arch, M.Sc.

Received his B.Arch in Architecture from Dokuz Eylül University Faculty of Architecture (2005) and M.Sc. in Architectural Preservation from Istanbul Technical University Faculty of Architecture (2008). Major research interests include architectural documentation and preservation. mcs@rekaremimarlik.com, cingi.salman@gmail.com

F. DOĞAN TEKİN; B.Sc., B.Arch

Received his B.Sc. from Yıldız Technical University Faculty of Geodesy and Photogrammetry Engineering (2009) and B.Arch. in Architecture from Gedik University Faculty of Architecture (2022). Major research interest includes architectural survey and documentation with new technologies. dogan@zemastek.com, dogantkn@gmail.com

DOMINIQUE LANGIS-BARSETTI; B.A., M.A.

Received her B.A. in Anthropology from the McGill University (2011) and her M.A. in Near and Middle Eastern Civilizations from the University of Toronto (2014). She is currently a Ph.D. candidate at the University of Toronto. Major research interests include ancient urbanism, remote sensing, and 3D modelling and simulation. dominique.langis.barsetti@mail.utoronto.ca, d.langisbarsetti@gmail.com

NURÇE DÜZALAN SALMAN; B.Arch, M.Sc.

Received her B.Arch in Architecture from Dokuz Eylül University Faculty of Architecture (2005) and M.Sc. in Architectural Preservation from Istanbul Technical University Faculty of Architecture (2009). Major research interests include design in historical environment, architectural documentation and preservation. nds@rekaremimarlik.com, nurced@gmail.com

JESSICA R. ROBKIN, B.A., M.A., Ph.D., RPA

Received her B.A. in Anthropology and Classics from the University of Florida (2000), her M.A. in Anthropology from Florida Atlantic University (2012), and her Ph.D. degree in Integrative Anthropological Sciences from the University of Central Florida (2023). Major research interests include cultural heritage management and protection, geospatial studies, and modeling and simulation. jessica.robkin@ucf.edu, jrobkin@gmail.com

A NEW APPROACH CHANGING EXPECTATIONS FROM SOLID PARTS OF BUILDING ENVELOPES: TESTING THE CARBON DIOXIDE DIFFUSION AND RETAINING PERFORMANCES OF BUILDING MATERIALS (1)

Başak YÜNCÜ KARANFİL*, Ayşe TAVUKÇUOĞLU**

Received: 27.04.2022; Final Text: 09.03.2023

Keywords: Carbon dioxide diffusion tests; building materials; CO₂ reduction performance; indoor air quality; effective CO₂ diffusion coefficient; CO₂ retaining behavior.

1. This article is produced from the master's thesis of Başak Yüncü, entitled "Assessment of carbon dioxide transmission through porous building materials in relation to indoor air", under supervision of Assoc. Prof. Dr. Ayşe Tavukçuoğlu and co-supervision of Prof. Dr. Emine N. Caner-Saltık.

INTRODUCTION

Contemporary building technology focuses on fully airtight building envelopes supported with mechanical or hybrid ventilation systems for energy-efficient buildings and healthier indoors. In fact, during COVID-19 pandemic and associated lock-downs, people realized how valuable fresh air is in built environments. Experts and governments promoted natural ventilation to meet higher air change rates. If mechanical ventilation is the only option, it is recommended to stop recirculation and feed the indoor air with 100% outdoor air (ASHREA, 2020; REHVA, 2021). These recommendations are quite challenging for a sustainable construction sector aiming at energy efficiency. This challenge presents an opportunity to think out of the box. In other words, this situation awakens curiosity to other undiscovered horizons beyond the common approach which encourages fully airtight built environments and advanced mechanical ventilation solutions. Here, this study asks a striking question: "What if the key to healthier indoor air is the breathable building envelopes?" This question may be considered as a paradigm shift for the building science community obsessed with airtightness. In fact, the concept of breathable walls is not new, but this hitherto underestimated approach is worth reconsidering.

The disadvantages of the fully-airtight built environments cannot be ignored. That is why the airtight building envelopes consisting of impermeable exterior walls by using moisture-proof and vapor-proof layers in their multi-layered compositions is no longer the only approach anymore. The experiences in construction practices over time have revealed that any failure in one of these impervious layers results in entrapped moisture within the wall section (Massari and Massari, 1993; Richardson, 2001).

In contrast to airtight building envelopes, the "breathable skin" concept has gained importance in today's construction practices in the last few decades.

* *Corresponding Author*; Department of Architecture, Faculty of Architecture, Middle East Technical University, Ankara, TÜRKİYE.

** Department of Architecture, Faculty of Architecture, Middle East Technical University, Ankara, TÜRKİYE.

Here, the term “breathable skin” refers to a multi-layered wall composed of highly water vapor permeable layers that allows water vapor to diffuse back and forth through the wall section. The historical and traditional material technologies achieved in the past have proved that the breathing features of a wall contribute to its long-term durability by preventing condensation and entrapped moisture problems (Kömürçüoğlu, 1962; Houben and Guillaud, 1989; Akkuzugil, 1997; Caner, 2003; Esen et al., 2004; Keefe, 2005; Örs, 2006; Morton, 2008; Šadauskiene et al., 2009; Tavukçuoğlu et al., 2013; Mlakar and Štrancar, 2013). In addition, that kind of breathable building envelopes provide a sort of self-ventilation through the porous body and are expected to contribute to cleaning the indoor air at a certain level (Yüncü et al., 2014; Yüncü 2016; Niemela et al., 2017; Benavente and Pla, 2018). However, there is a lack of knowledge in the literature on the quantitative assessment of the air exchange potential of porous building materials, specifically forming the solid part of the building envelope. Building envelopes composed of building materials with a certain CO₂ reduction (CO₂ transmission and retaining) performance can also be useful for regulating the concentrations of occupant-related indoor air pollutants. That approach of testing materials for CO₂ reduction behavior in order to identify the appropriate building materials to create breathable and CO₂-reducing wall systems, rather than airtight ones, is a novel and challenging research topic in the field.

A comprehensive discussion of the relevant literature is summarized under the following heading. The outputs of the discussion revealed the necessity of testing the CO₂ reduction performance of building materials in terms of measurable parameters and assessing the impact of that performance on indoor air quality. In this regard, the study proposes “CO₂ diffusion coefficient” and “CO₂ retaining ratio” as indicators to measure CO₂ reduction performance of building materials and introduces a practical testing method to assess the materials’ contribution to indoor air quality.

DISCUSSION ON BACKGROUND INFORMATION

Depending on the daily activities of today’s modern lifestyle, people spend most of their time in buildings (Walden, 2018). It is well-known that healthy indoor air is a right for every human being (WHO, 2000). However, the recent COVID-19 pandemic shows that poorly-ventilated indoor environments can easily become a source of airborne contagious diseases. Accordingly, providing good indoor air quality is essential for the built environment. In this regard, there are so many studies on finding out solutions for maintaining healthy indoor air in airtight buildings. On the other hand, a new approach that changes expectations from solid parts of building envelopes is emerging. At that point, it is worth investigating the potentials of building materials in cleaning indoor air. Accordingly, there is a scarcity of knowledge related to the impact of the solid parts of the building envelope on indoor air quality. This signals the necessity of measurable parameters and experimental methods to assess such an impact on a quantitative basis.

Achieving high airtightness seems to be desirable from the energy efficiency point of view since the presence of air leakage is expected to weaken the energy efficiency of the building envelope (Feist et al., 2005; Sassi, 2013; PHI, 2013; Cotterell and Dadeby, 2013; Pukhal et al., 2015). On the other side, the fully-airtight indoors engender the risk of poor IAQ (indoor air quality), therefore necessitating the integration of continuous

and automated mechanical ventilation and air conditioning (VAC) systems in buildings to achieve healthy indoor air. According to the COVID-19 pandemic measures, mechanical ventilation systems has to be fed by 100% fresh air (ASHREA, 2020; REHVA, 2020; Elsaid and Ahmed, 2021; ECDC, 2021). Like a vicious circle, the operation of these systems with fresh air feed increases the consumption of electrical energy and decreases the energy efficiency of the building (Van de Wal et al., 1991; Sakaguchi and Akabayashi, 2003; Williams, 2012; Derbez et al., 2014). Moreover, in the case that the mechanical VAC systems are not properly functional or maintained, the concentration of indoor air pollutants reaches unhealthy levels that may cause sick building syndrome and the spread of air-borne contagious diseases. Considering all, smart approaches with focuses on breathable envelopes and pollutant-removal finishing materials are the recent interests of the scientific research studies (IOM, 2011; Heidari et al., 2017; EPA, 2019).

An approach based on human skin analogy is guiding a better understanding of the indoor air cleaning performances of building envelopes (Gruber and Gosztanyi, 2010; Pohl and Nachtigall, 2015; Öztoprak, 2018). Despite the fact that the contribution of human skin to the total oxygen supply mechanism of the whole body is proportionally very small, this contribution has vital importance for the whole body system (Stücker et al., 2002; Pucci et al., 2012). Apart from O₂ and CO₂ exchange, human skin also plays a role in the exclusion of toxic materials such as numerous volatile organic compounds (VOCs) (Mochalski et al., 2013; Mochalski et al., 2014; Mochalski et al., 2018). Similar to the respiratory function of human skin, the self-ventilation ability of building envelope is predicted to have important effects on providing a healthy building skin and healthy indoor environment. Here, the term “self-ventilation” refers to the natural ventilation capability of a building material itself through its porous body. Departing from the widely used architectural analogy between the human skin and the building envelope, such an indoor air cleaning function performed by the building skin contributes to reducing the concentration of indoor air pollutants (Clements-Croome, 2004; British Gypsum, N.D.). Therefore, there is a necessity to measure indoor air pollutant reduction performances of building materials forming the building envelope and to develop relevant testing methods for assessment of such performances.

Indoor Air Quality (IAQ) and CO₂ as an IAQ Indicator

Achieving physical indoor comfort conditions, including healthy indoor air, is within the responsibilities of designers and engineers. Being part of the architectural design, the building envelope is expected to eliminate building-related inefficiencies such as inadequate ventilation, heating and cooling conditions, poor lighting and acoustical features, and the use of VOC-emitting materials. Several studies show that occupants experience physical symptoms of sick building syndrome and they feel discomfort due to inadequate indoor air (Fisk and Rosenfeld, 1997; Samet and Spengler, 2003). To avoid that inconvenience and to provide healthier indoor air, it is simply suggested to supply fresh air and increase air exchange rate (ESFA, 2018). Worldwide indoor CO₂ monitoring studies show that serious indoor air quality issues have been present even in developed countries. One of the challenging issues is the design of building skins which contribute to indoor air pollutant reduction. However, the unknowns related to air pollutant reduction performance of building materials are

so many. Unfortunately, many international and national institutes such as GREENGUARD Environmental Institute (GEI), American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), California Department of Public Health (CDPH), American Society for Testing and Materials (ASTM) do not consider air pollutant reduction performance of building materials in the widely-used IAQ assessment and estimation methods (GEI, 2010; ANSI/ASHRAE 62.1-2016, 2016; CDPH, 2017; ASTM E741-11:2017, 2017; ASTM D6245-18:2018, 2018). Therefore, the relevant existing standards and applications are to be investigated and discussed accordingly.

The pollutants – which adversely affect the indoor air quality – are classified mainly in two groups namely; outdoor-related and indoor-related pollutants. This study deals with the pollution of indoor air with a focus on occupant-related pollutants. The sources of occupant-related indoor air pollutants originate from human breath and skin metabolism (Fanger, 1998; Phillips et al., 1999). These pollutants are mostly composed of CO₂ and human VOCs. Among those pollutants, CO₂ is the well-known one that is emitted by the human body. As a gas, CO₂ is one of the widely-used indicators for assessing indoor air quality as well as the human presence in interior spaces (Yang et al., 2014; Candanedo and Feldheim, 2015; Huang and Mao, 2016) Therefore, the activity-dependent correlation between occupant presence and indoor carbon dioxide concentration encourages the CO₂ monitoring studies for the IAQ assessment.

Literature presents some international standards and guidelines to define indoor air quality in terms of CO₂ concentration levels. For instance, according to ASHRAE 62.1-2016 standard, an indoor CO₂ concentration (C_{IN} ppm) above 5000 ppm is considered an unacceptable level that can pose a health risk for occupants (ANSI/ASHRAE 62.1-2016, 2016). In addition, if the indoor CO₂ concentration is 700 ppm above the outdoor level, occupants are expected to experience discomfort. The indoor CO₂ concentration level above the level of outdoor CO₂ concentration (C_{OUT} ppm) also signals the presence of odorous bio-effluents which are the other contaminants, sourced from occupants (ANSI/ASHRAE 62.1-2016, 2016; ASTM D6245-18:2018, 2018). Therefore, the difference between the indoor and outdoor CO₂ concentration levels in ppm (ΔC , ppm) is used as an indicator of bio-effluents; in other words, an indicator of occupant discomfort. According to the EN 13779:2007 standard, indoor air quality is assessed by taking into consideration both the C_{OUT} level and ΔC levels (EN 13779:2007, 2007). The range of C_{OUT} level is given as 300-500 ppm in ASHRAE 62.1-2016 standard while the C_{OUT} level is defined as 350 ppm for rural areas, 375 ppm for suburban areas or small towns and 400 ppm for polluted city center in European Standards (EN 13779:2007, 2007; ANSI/ASHRAE 62.1-2016, 2016; ASTM D6245-18:2018, 2018). Considering the reference ΔC and C_{OUT} levels given in EN 13779:2007 standard, the indoor CO₂ concentration levels can be categorized into certain ranges: the C_{IN} level below 800 ppm corresponding to high quality; between 800-1000 ppm corresponding to medium quality; between 1000-1400 ppm corresponding to reduced quality and; above 1400 ppm corresponding to low quality (as in Figure 1). According to the reference ΔC and C_{OUT} levels given in ASHRAE 62.1-2016 standard and ASTM D6245-18 standard guide, the C_{IN} levels above 1000-1200 ppm may lead occupants to experience discomfort and that range is consistent with the reduced quality range as categorized in EN13779:2007 standard (Figure 1). In addition, the C_{IN} level above 2000 ppm is considered to be hygienically unacceptable (Lahrz et al., 2008;

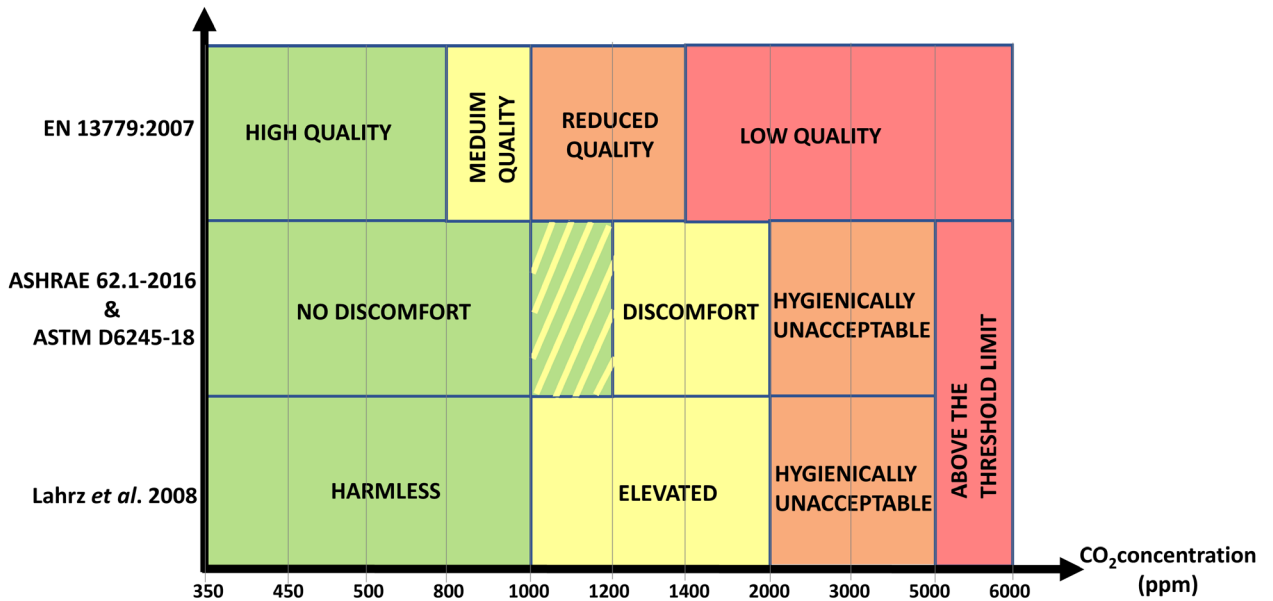


Figure 1. The indoor CO₂ concentration levels (C_{IN}, ppm) categorized by taking into consideration the reference CO₂ concentration difference (ΔC, ppm) and outdoor CO₂ concentration levels (C_{OUT}, ppm) levels given in international standards and the literature. This figure is prepared by the authors.

Twardella et al., 2012) and the C_{IN} level above 5000 ppm is accepted as the threshold limit value where the CO₂ concentration may cause health risks (ANSI/ASHRAE 62.1-2016, 2016; ASTM D6245-18:2018, 2018).

Currently, EN 13779:2007 standard has been withdrawn and replaced by EN16798-3:2017 standard (EN 16798-3:2017, 2017). The new standard declared in 2017 does not contain the main classification defining the high, medium, reduced and low ranges for indoor air quality in terms of CO₂ concentrations. Instead, it introduces a classification based on supply air quality. Since measuring the concentration of indoor air pollutants is a reliable method for confirming whether the IAQ is on the safe side or not, the inclusion of carbon dioxide concentration classification is recommended (Mazzarella and Hogeling, 2018).

Most recent studies investigate the relationship between indoor CO₂ concentration levels and occupants' health, comfort and cognitive performances. For instance, if the CO₂ concentration is increased from 600 ppm to 1000 ppm in controlled room conditions, a moderate reduction in six of nine scales of decision-making performance is observed while a significant reduction in seven of nine scales of decision-making performance is observed when CO₂ concentration is increased from 1000 ppm to 2500 ppm (Satish et al., 2012). In spite of the significant reduction in cognitive performances of the occupants, a slight increase is observed in the focused activity scale. Another study revealed that when the indoor air CO₂ concentration increases up to 3000 ppm from 600 ppm, the air quality becomes significantly less comfortable for occupants in terms of subjective comfort parameters (Kajtar and Herczeg, 2012). Data on several physiological and psycho-physiological measures prove that when people spend 2 to 3 hours in indoor air with a CO₂ concentration of 3000 ppm or above, greater efforts are needed for performing mental tasks; therefore, the occupants feel much more exhausted (Kajtar and Herczeg, 2012). In short, people feel worse and their focusing capacity gradually decline with the increase in C_{IN} levels. Besides, the reference C_{IN} levels categorized in international standards as "uncomfortable range (C_{IN} > 1000 ppm)", "reduced air quality range (1000 ppm < C_{IN} < 1400 ppm)", "low air quality

ranges ($1400 \text{ ppm} < C_{\text{IN}} < 2000 \text{ ppm}$)” and “hygienically unacceptable range ($C_{\text{IN}} \text{ level} > 2000 \text{ ppm}$)” (Figure 1), are the contaminated circumstances for occupants that may cause decline in their cognitive performances and require fresh air intake by ventilation.

The studies which measured the actual CO_2 concentration levels in various spaces such as classrooms, meeting rooms, offices and bedrooms reveal that the daily average CO_2 concentration levels (C_{AVG} levels) are mostly above 1000 ppm which indicate uncomfortable circumstances (**Table 1**) (Corsi et al., 2002; Whitmore et al., 2003; Fromme et al., 2007; Fisk et al., 2010; Kim et al., 2011; Bulut, 2012; Batog and Badura; 2013; Gaihre et al., 2014; Muscatiello et al., 2015; Canha et al., 2016; Petersen et al., 2016; Vilčeková et al., 2017; Shin et al., 2018). Among those measurements, the C_{AVG} levels exceeding 1400 ppm and 2000 ppm exhibit low air quality and hygienically unacceptable air quality, respectively. Especially in cold seasons, the maximum CO_2 concentration levels are observed to reach above 3000 ppm that signal noticeably-polluted indoor air (Corsi et al., 2002; Fromme et al., 2007; Kim et al., 2011; Batog and Badura; 2013). Another study exhibits that the maximum CO_2 concentration levels (C_{MAX}) in a meeting room with around a volume of 500 m^3 can reach up to 2000 ppm or more within the periods of 30 to 90 minutes (Fisk et al., 2010). Considering all these studies, indoor air may become unhealthy for occupants within a short period of time in case that fresh air intake is not allowed or not enough. One way or another, fresh air intake is necessary to avoid such polluted interiors and to reduce CO_2 concentration. Besides, building envelopes composed of building materials with a certain CO_2 reduction performance can also be useful for regulating the concentrations of indoor air pollutants. This approach is a novel and challenging research topic in the field.

CO_2 Diffusion Coefficient as an Indicator of CO_2 Reduction Performance

The breathing features of a building material is commonly determined by measuring the amount of water vapor diffused through its porous matrix in a certain period of time when a certain difference in water vapor pressures of two neighboring media is provided (TS EN ISO 7783:2015, 2015). However, the major indicator that presents the concentration of occupant-related indoor pollutants in a space is the CO_2 gas. The molecular volume and molar mass of CO_2 is larger than those of water vapor (H_2O) and the CO_2 diffusion coefficient in the air (cm^2s^{-1}) is smaller than the H_2O diffusion coefficient in the air (**Table 2**) (Cussler, 1997; Welty, 2019). The water vapor diffusion rate (g/hm^2) is a well-accepted parameter to define breathability characteristics of building materials (TS EN ISO 7783:2015, 2015; Strother and William, 1990; Richardson, 2001; ASTM E96/E96M-16:2016, 2016; DIN EN ISO 12572:2017). On the other hand, water vapor diffusion rate is not enough to define the pollutant reduction capability of building materials concerning indoor air quality (Yüncü 2016; Niemela et al., 2017). Considering that diffusion of CO_2 is slower than that of H_2O in porous media, the effective CO_2 diffusion coefficient in materials is comparatively a more decisive parameter of occupant-related pollutant reduction performance. In addition, any possible interaction between the CO_2 and the building material may cause CO_2 to be retained by the material. In this regard, this study introduces “effective CO_2 diffusion coefficient ($D_{\text{EFF}} \text{ cm}^2\text{s}^{-1}$)” and “ CO_2 retaining ratio ($M_{\text{RET}}/M_{\text{P}}$ % by weight)” as material-specific parameters to assess pollutant reduction features of building materials.

Room function	C _{AVG} (ppm)	C _{MAX} (ppm)	C _{OUT} (ppm)	Country	Reference
Classroom	1180	1828	340-410	USA	Corsi et al. 2002
	1653	2570			
	2857	3337			
	NA	4172 (in winter)	381-490	Germany	Fromme et al., 2007
	NA	1875 (in summer)	338-509		
	2417	4113	382-530	Korea	Kim et. al, 2011
	998	2324	313-475	Turkey	Bulut, 2012
	1086	2167	NA	UK	Gaihre et al., 2014
	812	1591	NA	USA	Muscatiello et al., 2015
	1610±500	2740	NA	Denmark	Petersen et al., 2016
	1290	2220	NA	France	Canha et al. 2016
	1315 (winter) 1094 (summer)	1651 (winter) 1241 (summer)	400	Slovakia	Vilčekováa et al., 2017
	1064 (portable) 1074 (traditional)	above 2000 above 2000	426.5	USA	Whitmore et al., 2003
1695-987	above 3000	363-566	Italy	Schibuola and Tambani 2020	
Office	885	1685	313–475	Turkey	Bulut, 2012
Meeting room	NA	1910±263	510	USA	Fisk et al.,2010
Bedroom	1508 (object 1)	3277±554	NA	Poland	Batog and Badura, 2013
	2755 (object 2)	3874±628			
	1935 (object 3)	2730±104			
	719 (object 4)	1583±200			
	535 (object 5)	1894±44			
	NA	2216	NA	Korea	Shin et al., 2018
1210-712	above1250	NA	Portugal	Belmonte et al., 2019	
Living room	971-653	above1250	NA		

Table 1. Time-weighted average of CO₂ concentration levels (C_{AVG}) and maximum CO₂ concentration levels (C_{MAX}) measured during working hours (in classrooms, offices and meeting rooms) or sleeping hours (in bedrooms). This table is prepared by the authors.

PROPOSED TESTING METHOD

The new testing method proposed in the study is based on measuring the CO₂ concentration changes in neighboring spaces in a certain period of time when partial pressure difference of CO₂ is provided between those two adjacent spaces separated by a building material. The common approach in the literature is testing the airtightness of building envelope by means of monitoring the indoor CO₂ concentration when a certain amount of CO₂ intake to the enclosed space is provided. For that purpose, three testing methods, namely; “concentration decay test method”, “constant injection test method” or “constant concentration test method” are recommended to measure air leakages through the air gaps of building envelope with the use of CO₂ as the tracer gas (ASTM E741-11:2017, 2017). However, the main target of the testing method proposed in the study is to measure the CO₂ reduction performance of a building material forming the solid parts of building envelope rather than to measure the airtightness performance of a building envelope. The other target of the proposed testing method is to

Table 2. The comparison of CO₂ and H₂O in the gas form under 1 atm. pressure in terms of diffusion coefficient (cm²s⁻¹) in air, molecular volume and molar mass (Cussler, 1997; Welty, 2019). This table is prepared by the authors.

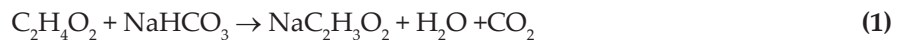
Gas	Diffusion coefficient in air (cm ² s ⁻¹)	Temperature (°C)	Molecular Volume (cm ³ .mol ⁻¹)	Molar Mass (g)
H ₂ O	0.282	16	18.9	18
	0.26	25		
CO ₂	0.148	9	34.0	44
	0.16	25		

develop a practical and repeatable experimental setup that does not require sophisticated instruments used for controlled managing and measuring CO₂ intake and outtake.

Here, the test method proposed in the study is composed of two experimental setups, namely; “single-chamber” and “double-chamber”. The single-chamber setup is a system that permits CO₂ transmission through a building material from inside to outside and the CO₂ concentration reduction in the chamber is monitored during the transmission of CO₂ through the porous material. The double-chamber setup is a closed system that does not permit CO₂ escape and CO₂ transmission through the building material is monitored by taking CO₂ concentration measurements in neighboring chambers. The joint interpretation of the data achieved by those setups are used to determine the CO₂ reduction performance of building material in terms of measurable parameters, namely; “CO₂ diffusion rate (E, mg. s⁻¹)”, “effective CO₂ diffusion coefficient (D_{EFF} cm².s⁻¹)” and “CO₂ retaining ratio (M_{RET}/M_T % by weight).

“The CO₂ supply” and “the duration of one test session” are two main issues considered to make the testing method as practical as possible. A simple CO₂ source providing a high level of initial CO₂ concentration in a chamber is used. The high CO₂ concentration as an initial level enables monitoring CO₂ diffusion through a building material in more detectable ranges and shortening the test period to 24 hours. In daily life, occupant related indoor CO₂ emission occurs during working hours in an office room, whereas it occurs during sleeping hours in a bedroom on a daily basis. For that reason, examining the CO₂ reduction capability of building materials within a one-day cycle is more crucial to better understand their contribution to enhance indoor air quality.

For the single and double chamber diffusion tests, the source of CO₂ is provided by mixing acetic acid (C₂H₄O₂) and sodium bicarbonate (NaHCO₃) in a beaker put in the chamber (Equation 1). The mixture of 50 ml acetic acid and 2 g sodium bicarbonate generates approximately 500 mg CO₂ which approximately corresponds to the CO₂ concentration of 17500 ppm. The relative humidity (RH, %) in the sealed chamber is observed to increase by 2.5% at most within 10 hours after the reaction begins. Such a slight impact of the CO₂ source on the moisture content in the chamber shows that this source is appropriate for testing CO₂ diffusion. Together with the existing CO₂ amount in the fresh air, the highest level of CO₂ concentration provided is around 18000 ppm in a fully-airtight acrylic glass chamber with a volume of 0.016 m³. The tightness of the sealed acrylic glass chambers used in the experimental setups has been verified by preliminary tests that monitor CO₂ concentration in the chamber for 24 hours (ASTM E741-11:2017, 2017).



The CO₂ concentration measurements inside and outside the chambers are taken in specific time intervals with a CO₂ measuring device and CO₂ monitoring probes. The accuracy of the instruments should be similar for the CO₂ concentration ranges of below and above 5000 ppm. For reliable data acquisition, the calibration of the CO₂ monitoring probes, which will be positioned inside and outside the chambers, needs to be done.

The conversion of CO₂ concentration data collected by the CO₂ measuring device and the CO₂ monitoring probes from ppm to mg.m⁻³ units is done

by using Equation 2 and by considering a pressure of 1 atmosphere and a temperature of 25 degrees Celsius in the equation (Mihelcic et al., 2021). These conditions are typical assumption for the conversions of chemicals in the air (Boguski, 2020).

$$C(\text{in mg. m}^{-3}) = C(\text{in ppm}) \times MW \times \frac{P}{RT} \quad (2)$$

where,

C (in mg.m⁻³): CO₂ concentration in mg.m⁻³

C (in ppm): CO₂ concentration in parts per million

MW: molecular weight (44.01 g/mole for CO₂)

P: Pressure in atm (1 atm)

R: Gas constant (0.08205 L·atm·mol⁻¹·K⁻¹)

T: Temperature in K (25°C=298.15 K)

The single-chamber and double-chamber experimental setups, data acquisition and evaluation in terms of measurable parameters are explained under the related subheadings. Exemplary graphs are used to explain the data acquisition and evaluation stages of the test procedures. The experimental data presented in those graphs belong to the adobe samples which will be described further in Section 3.

Single-Chamber Experimental Setup

The single-chamber is composed of an acrylic glass rectangular prism with one of its sides enclosed with building material sample allowing CO₂ diffusion and the other side sealed to air passage (Figure 2). In addition, the edges where the material sample and test chamber meet, and the peripheral surfaces of the material sample are fully sealed against air leakages. Acrylic sealant and at least three layers of stretch film is used for that purpose. In short, the CO₂ transmission is only permitted through the building material in one direction. Criteria that ought to be considered while deciding the dimensions of the chamber include; the sizes of the building material sample under examination and achievement of enough space to host the CO₂ measuring probes. Here, the building material samples are prepared in the form of rectangular prisms with the dimensions of 180 mm × 125 mm × 305 mm (thickness × width × length). The thickness of the sample is the distance where CO₂ transmission occurs. The fully-airtight acrylic glass chamber is produced with a volume of 0.016 m³ (with dimensions of 390 mm × 130 mm × 310 mm). In addition, the building material sample is kept in the test environment for a week to be in equilibrium with the microclimatic conditions of the testing environment. A constant CO₂ concentration level outside the chamber, i.e., around 500 ppm corresponding to the outdoor concentration should be provided.

The CO₂ concentration decay in the chamber is due to the material's CO₂ diffusion characteristics and the partial pressure difference between its inside and outside. The decrease in CO₂ concentration in the chamber is a building material's performance defined as "CO₂ concentration decay rate (RD_{SINGLE} mg.m⁻³.s⁻¹)". The test procedure for the same sample should be repeated several times. Achieving similar results also verify the targeted airtightness of the setup.

Double-Chamber Experimental Setup

The double-chamber setup is composed of fully-sealed two acrylic glass rectangular prisms and the building material sample positioned in between

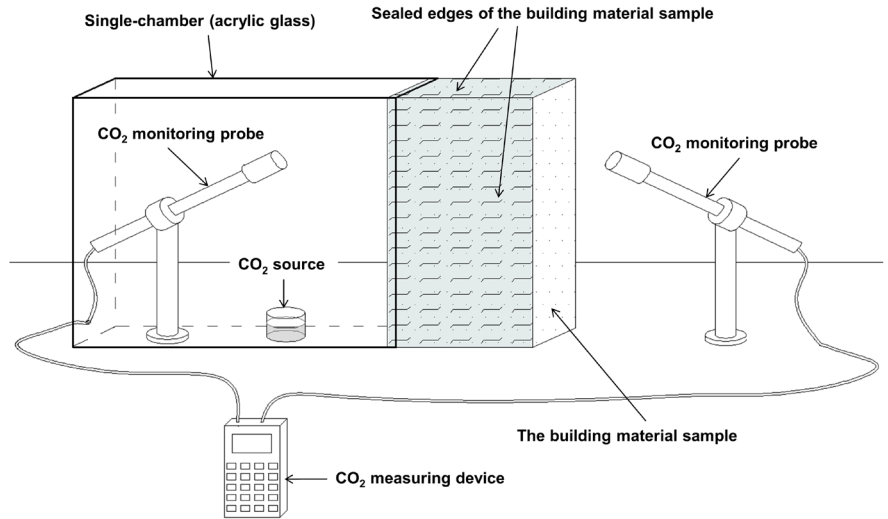


Figure 2. The descriptive sketch of the single-chamber experimental setup. This figure is prepared by the authors.

the two chambers (Figure 3). The edges where the material sample and test chambers meet, and the peripheral surfaces of the material sample are fully sealed against air leakages; by using acrylic sealant and at least three layers of stretch film. The chambers used in the double-chamber experimental setup are the same in size with dimensions of 390 mm × 130 mm × 310 mm. The building material samples are prepared in the form of rectangular prisms with dimensions of 180 mm × 125 mm × 305 mm (thickness × width × length) and kept in the test environment for a week to be in equilibrium with the microclimatic conditions of the testing environment. A high CO₂ concentration level is provided by placing the CO₂ source in Chamber-1. An initial CO₂ concentration level in Chamber-2, around 500 ppm corresponding to the outdoor concentration, is provided.

The data obtained from the single-chamber setup reveals the CO₂ reduction performance of the material. That performance is due to CO₂ diffusion and CO₂ retaining characteristics which are related to the pore structure and mineralogical composition of the material. The double-chamber experimental setup is a closed system and enables measuring the CO₂

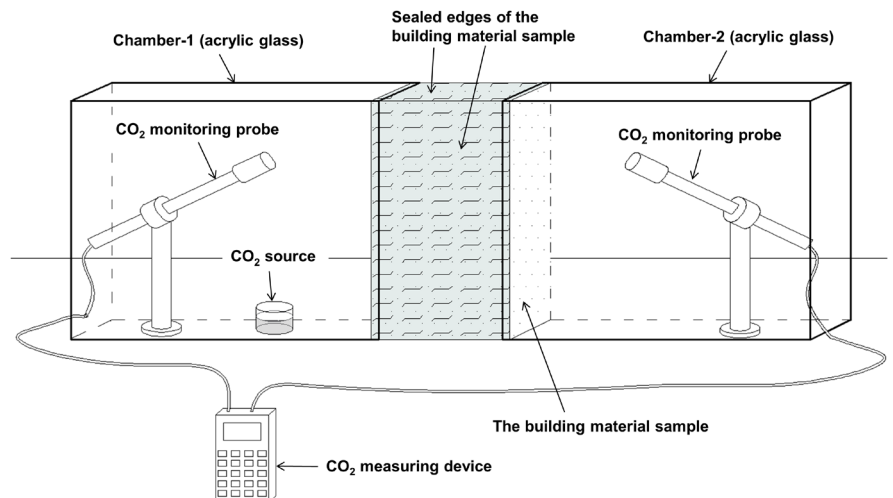


Figure 3. The descriptive sketch of the double-chamber experimental setup. This figure is prepared by the authors.

retaining performance of the material. Any difference between the overall amount of CO₂ in the closed system (M_{T_r} mg) and the total amount of CO₂ measured in the chambers ($M_{Ch1-F} + M_{Ch2-F}$) reveals that the building material keeps a certain amount of CO₂ in its body due to its CO₂ absorption/adsorption characteristics. This knowledge is valuable to interpret the CO₂ concentration decay rate (RD_{SINGLE} mg.m⁻³.s⁻¹) data obtained from the single-chamber experiment. In short, the joint evaluation of the data obtained from the single-chamber and double-chamber experiment is necessary to discuss CO₂ reduction performance in terms of CO₂ diffusion and retaining behaviors. The CO₂ retaining behavior of building material samples can be investigated by means of chemical and mineralogical property analyses.

The test procedure for the same sample should be repeated several times. The total amount of CO₂ (M_{T_r} mg) in this closed system is the key control parameter to verify the targeted airtightness of the setup.

Data Acquisition and Evaluation in terms of Measurable Parameters

The CO₂ concentration decay rate (RD_{SINGLE} mg.m⁻³.s⁻¹) is obtained by producing the graph which shows the CO₂ concentration data measured in the single-chamber as a function of time. The slope of the linear regression belonging to the fastest CO₂ reduction is used to determine the RD_{SINGLE} value (Figure 4). The experimental data presented in Figure 4 is obtained by testing the adobe samples.

The RD_{SINGLE} data extracted from that graph is used to calculate the CO₂ diffusion rate (E , mg. s⁻¹) and the effective CO₂ diffusion coefficient (D_{EFF} cm².s⁻¹) of the building material based on Equation 3 and 4, respectively. A brief definition of the parameters related to the single-chamber diffusion test are given below:

- **Concentration decay rate in single-chamber (RD_{SINGLE} mg.m⁻³.s⁻¹):** It is the initial rate presenting the fastest reduction in CO₂ concentration until the fastest concentration decay starts to slow down due to the significant decrease in the partial pressure difference between the inside and outside of the chamber (Figure 4). That initial period of

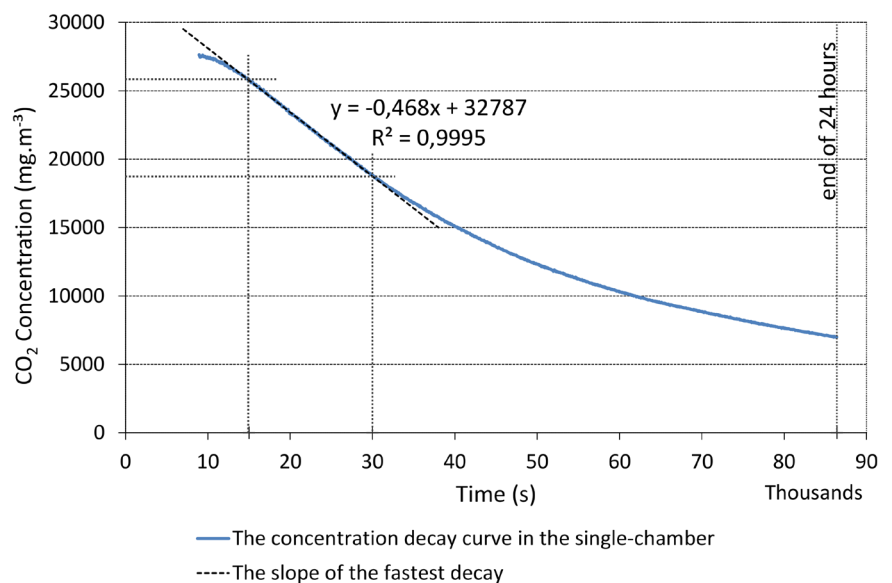


Figure 4. The CO₂ concentration decay curve versus time obtained from the 24hrs experiment period of the single-chamber diffusion test and showing the slope of the fastest CO₂ concentration decay in the chamber (The experimental data belongs to the adobe samples). This figure is prepared by the authors.

concentration decay is considered during the regression analysis. RD_{SINGLE} is the slope of the best-fit linear regression of this initial period.

- **CO₂ diffusion rate** (E, mg.s⁻¹): It is the amount of CO₂ that diffuses through a porous material in time (Jacobs, 1967; Wilson et al., 2009). It is calculated by using RD_{SINGLE} values obtained from the single-chamber tests using Equation 3.

$$E = RD_{SINGLE} \times V \quad (3)$$

where,

E: CO₂ diffusion rate, mg.s⁻¹

RD_{SINGLE} : CO₂ concentration decay rate measured by the single-chamber test, mg.m⁻³.s⁻¹

V: Volume of the chamber, m³

- **Effective CO₂ diffusion coefficient** (D_{EFF} , cm².s⁻¹): It is the amount of CO₂ which crosses through the unit section area of a porous material perpendicular to the diffusion direction in unit time and at the unit concentration gradient. It is calculated using Equation 4 which is based on Fick's law (Jacobs, 1967; Wilson et al., 2009).

$$D_{EFF} = \frac{E \times L}{A(C_{SOURCE} - C_0)} \quad (4)$$

where,

D_{EFF} : Effective CO₂ diffusion coefficient, cm².s⁻¹

E: CO₂ diffusion rate, mg.s⁻¹

L: Thickness of the building material sample, cm

A: Area of the plane perpendicular to the diffusion direction, cm²

C_{SOURCE} : The initial CO₂ concentration in the single-chamber, mg.cm⁻³

C_0 : The CO₂ concentration outside the chamber, mg.cm⁻³

The data obtained from the double-chamber diffusion test is crucial to clarify whether the CO₂ concentration decay (RD_{SINGLE}) is induced by the CO₂ retaining behavior of the material or not. The double-chamber experimental setup is a closed system and the total amount of CO₂ (M_T , mg) in this closed system should be the same before and after the diffusion test. The data evaluation for determining the amount of CO₂ retained by the building material is explained below:

- The total amount of CO₂ in the closed system (M_T , mg), as shown in Equation 5, is the sum of the CO₂ amount in the chambers before the test was initiated and the CO₂ amount generated by the source.

$$M_T = M_{Ch1-I} + M_{Ch1-S} + M_{Ch2-I} = M_{Ch1-F} + M_{Ch2-F} + M_{RET} \quad (5)$$

where,

M_T : The total amount of CO₂ in the closed system, mg

M_{Ch1-I} : Initial amount of CO₂ in Chamber-1, mg

- M_{CH1-S} : Amount of CO_2 generated by the source in Chamber-1, mg
- M_{CH2-I} : Initial amount of CO_2 in Chamber-2, mg
- M_{CH1-F} : Final amount of CO_2 in Chamber-1 by the end of 24h test duration, mg
- M_{CH2-F} : Final amount of CO_2 in Chamber-2 by the end of 24h test duration, mg
- M_{RET} : Amount of CO_2 retained by the material sample by the end of 24h test duration, mg

- After the 24 hours test duration, the difference between the total CO_2 amount in the closed system (M_T mg) and the measured CO_2 amount in the chambers ($M_{CH1-F} + M_{CH2-F}$ mg) is the amount of CO_2 retained by the material (M_{RET} mg) (Equation 6).

$$M_{RET} = M_T - (M_{CH1-F} + M_{CH2-F}) \quad (6)$$

- **CO_2 retaining ratio** (M_{RET}/M_T % by weight): It is the ratio of M_{RET} to the total CO_2 amount in the closed system and an indicator in percentage to define the CO_2 retaining behavior of the material on quantitative basis.

The amount of CO_2 retained by the material after 24 hours can be confirmed by the curves of CO_2 concentration decay in Chamber-1 and the increase in Chamber-2. The data achieved during the double chamber diffusion test is summarized in the graph showing the plot of CO_2 concentration in the chambers versus time (Figure 5). Concentration increase rate in Chamber-2 (RI_{DOUBLE} $mg.m^{-3}.s^{-1}$) is extracted from that graph.

- **Concentration increase rate in Chamber-2** (RI_{DOUBLE} $mg.m^{-3}.s^{-1}$): It is the initial rate presenting the fastest increase in CO_2 concentration in Chamber-2 until the fastest concentration increase starts to slow down (due to the significant decrease in the partial pressure difference between Chamber-1 and Chamber-2). That initial period of concentration increase is considered during the regression analysis. RI_{DOUBLE} is the slope of the best-fit linear regression of this initial period.

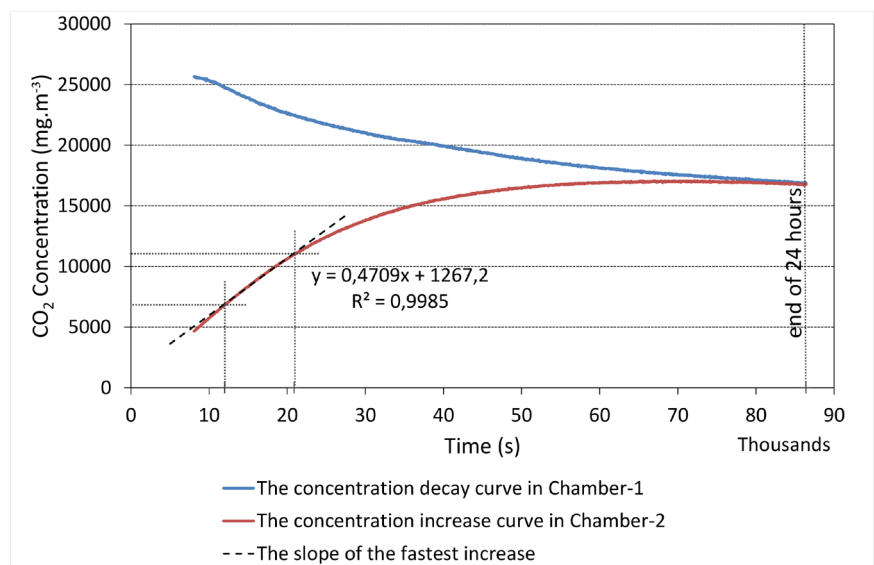


Figure 5. The CO_2 concentration decay curve in Chamber-1 (in blue) and the CO_2 concentration increase curve in Chamber-2 (in red), obtained by plotting the CO_2 concentration data versus time during the 24-hour experimental period of double-chamber diffusion test. (The experimental data belongs to the adobe samples.) This figure is prepared by the authors.

- The RI_{DOUBLE} value, if noticeably lower than the RD_{SINGLE} value, signals that building material retains CO_2 in its body. On the other hand, the RI_{DOUBLE} value, if close to the RD_{SINGLE} value, signals that the CO_2 reduction capability of the building material to a certain extent, is provided by means of CO_2 transmission through the material's body.

A SAMPLE USE OF THE PROPOSED TEST METHOD

The proposed test method is used for measuring the CO_2 reduction performance of two types of porous building materials; adobe as a traditional building material and the autoclaved aerated concrete (AAC) as a contemporary building material. The adobe sample refers to the molded and sun dried mud-based masonry unit without any mortar and/or plaster layers. It represents adobe material which has kaolin and illite group clay minerals (Yüncü, 2016). The AAC samples are two types of samples: load bearing unit (AAC/G4) and infill masonry unit (AAC/G2). No mortar or plaster layer is used. Although both types of materials are well-known by their high water vapor permeability characteristics (Kömürçüoğlu, 1962; Örs, 2006; Meriç et al., 2013; Meriç et al., 2014), their CO_2 reduction performances have not been tested and identified yet in published literature. The basic physical and physicochemical properties of the examined material samples in terms of bulk density (ρ), effective porosity (ϕ), ultrasonic pulse velocity (UPV), modulus of elasticity (MoE), water vapor diffusion resistance factor (μ) and equivalent air thickness of water vapor resistance (SD) are summarized in **Table 3** (Yüncü 2016).

The single and double chamber diffusion tests are conducted on adobe and autoclaved aerated concrete (AAC) samples prepared in the dimensions of 180 mm \times 125 mm \times 305 mm (thickness \times width \times length). The thickness of 180 mm is the distance where CO_2 transmission occurs. These samples are kept at $25^\circ C \pm 1^\circ C$ and $35\% \pm 1\%$ relative humidity in laboratory conditions for a week so as to be in equilibrium with the microclimatic conditions of the testing environment. The fully-airtight acrylic glass chambers are produced with a volume of 0.016 m^3 (with dimensions of 390 mm \times 130 mm \times 310 mm). The material samples are individual adobe and AAC masonry units which are not plastered and do not involve any bedding or jointing mortar. The peripheral surfaces of the samples are wrapped with three layers of stretch film. The width and length of the chambers are 5 mm greater than those of samples to allow complete fitting of each wrapped material sample into the acrylic glass chamber. The edges where the material sample and the chamber meet are fully sealed with acrylic sealant. The pressure and the temperature of the laboratory environment

Table 3. The basic physical and physicochemical properties of the adobe and autoclaved aerated concrete samples. This table is prepared by the authors.

Building material	Bulk density	Effective porosity	Ultrasonic pulse velocity	Modulus of elasticity	Water vapor diffusion resistance factor	Equivalent air thickness of water vapor resistance (for 18cm-thick sample)
	ρ (g.cm^{-3})	ϕ (%)	UPV (m.s^{-1})	MoE (GPa)	μ (unitless)	SD (m)
Adobe Load bearing unit	1.60 \pm 0.03	42.4 \pm 0.3	1321 \pm 65	2.57 \pm 0.24	3.59 \pm 0.29	0.65 \pm 0.05
Autoclaved aerated concrete (AAC/G2) Infill unit	0.42 \pm 0.00	74.1 \pm 1.2	1703 \pm 20	1.11 \pm 0.02	2.13 \pm 0.45	0.38 \pm 0.08
Autoclaved aerated concrete (AAC/G4) Load bearing unit	0.62 \pm 0.02	67.7 \pm 2.5	1955 \pm 30	2.17 \pm 0.12	3.34 \pm 1.04	0.64 \pm 0.17

and the chambers of each setup were also constantly measured during the test duration to confirm isobaric and isothermal conditions. The pressure difference between the chambers and the laboratory environment was not over 0.0002 atm.

The data obtained from the single and double chamber diffusion tests are summarized in **Table 4**. Using Equation 3 and Equation 4, the RD_{SINGLE} data obtained from the single-chamber diffusion test is used to calculate the CO_2 diffusion rate (E , $mg \cdot s^{-1}$) and the effective CO_2 diffusion coefficient (D_{EFF} $cm^2 \cdot s^{-1}$) of the building material, respectively. The results of the single-chamber diffusion tests show that adobe and AAC samples have certain CO_2 reduction performances. The RD_{SINGLE} values of adobe, AAC/G2 and AAC/G4 samples were $0.47 \text{ mg} \cdot \text{m}^{-3} \cdot \text{s}^{-1}$, $0.41 \text{ mg} \cdot \text{m}^{-3} \cdot \text{s}^{-1}$ and $0.35 \text{ mg} \cdot \text{m}^{-3} \cdot \text{s}^{-1}$ respectively (**Table 4**). According to these data, the highest CO_2 decay rate belongs to the adobe sample followed by the AAC/G2 and AAC/G4 samples respectively. The effective CO_2 diffusion coefficient (D_{EFF}) values of adobe and autoclaved aerated concrete samples fall into the range of $0.012 \text{ cm}^2 \cdot \text{s}^{-1}$ and $0.0138 \text{ cm}^2 \cdot \text{s}^{-1}$ (**Table 4**).

There are a few recent studies in which D_{EFF} values of some porous building materials have been measured. For instance, in these studies; Namouniara et al., 2016 and Niemelä et al., 2017), the D_{EFF} values of gypsum board, porous fiberboard and highly-porous limestone are given as $0.014\text{-}0.023 \text{ cm}^2 \cdot \text{s}^{-1}$, $0.02\text{-}0.034 \text{ cm}^2 \cdot \text{s}^{-1}$ and $0.0153 \text{ cm}^2 \cdot \text{s}^{-1}$ respectively. The D_{EFF} values of adobe and AAC measured in this study corresponds to the range of D_{EFF} values given for those porous building materials in the literature.

Considering their D_{EFF} values, the examined adobe and autoclaved aerated concrete materials are porous materials that may have the potential to reduce indoor CO_2 concentration. The results of the double-chamber diffusion test reveal that the CO_2 reduction performance of adobe is mostly due to the CO_2 transmission through the material while the performance of AAC is due to its high CO_2 retaining characteristics. AAC/G2 and AAC/G4 blocks retain a considerable amount of CO_2 in their body with the M_{RET}/M_T values of 53% and 88% respectively, and permits less amount of CO_2 transmission from Chamber-1 to Chamber-2 by the end of the 24 hour-experiments (**Table 4**). The RI_{DOUBLE} values of AAC samples are lower than their RD_{SINGLE} values (**Table 4**) and these data confirm the CO_2 retaining performance of AAC samples. The CO_2 retaining behavior is an expected characteristic for the autoclaved aerated concrete samples. This behavior is attributed to the calcium carbonate formation resulting from the reaction of calcium hydroxide ($Ca(OH)_2$) existing in AAC with CO_2 in the chambers, at atmospheric humidity conditions (Kus and T. Carlsson, 2003; Matsushita et al., 2000; Matsushita et al., 2004).

The adobe sample has similar CO_2 reduction performance with AAC samples due to D_{EFF} values being close to each other (**Table 4**). On the other hand, the RI_{DOUBLE} value of adobe is close to its RD_{SINGLE} value and the CO_2 retaining ratio is at most 1% by weight which is negligible (**Table 4**). The

Table 4. The CO_2 diffusion and retaining properties of the adobe and autoclave aerated concrete samples. This table is prepared by the authors.

Sample	RD_{SINGLE} ($mg \cdot m^{-3} \cdot s^{-1}$)	E ($mg \cdot s^{-1}$)	D_{EFF} ($cm^2 \cdot s^{-1}$)	RI_{DOUBLE} ($mg \cdot m^{-3} \cdot s^{-1}$)	M_{RET}/M_T (% by weight)
Adobe	-0.4680	0.0075	0.0131	0.4709	0.74
AAC/G2	-0.4173	0.0067	0.0138	0.3569	53.23
AAC/G4	-0.3457	0.0055	0.0120	0.0144	88.35

joint interpretation of those data shows that the adobe sample is a highly CO₂ permeable material and has a potential of self-ventilation.

CONCLUSION

The enhancement of indoor air quality is one of the main concerns in airtight buildings. The impact of breathable envelopes, specifically the solid parts of the building walls, on enhancing indoor air quality is a challenging research topic that yet to be comprehensively investigated. This research tries to draw the attention of the building science community and sustainable construction sector to the pollutant reduction potentials of building materials in indoor environments. This study presents a new approach, new measurable parameters and a new practical test method. In contrast to the common approach of airtight buildings, the breathable building skin approach changes the performance expectations from solid parts of a building envelope. From this perspective, investigating the carbon dioxide reduction performance of building materials is a pioneer study.

A practical testing method including single-chamber and double-chamber experimental setups is proposed in the study for the assessment of the CO₂ reduction performance of building materials in terms of measurable parameters. To demonstrate an example of the test procedure, the proposed testing method was conducted on adobe and autoclaved concrete samples, which are well-known for their highly-porous and water vapor permeability properties;. The main parameters which are used to evaluate the data achieved by the single-chamber and double-chamber diffusion tests are as follows:

- CO₂ decay rate (RD_{SINGLE} , mg.m⁻³.s⁻¹)
- CO₂ diffusion rate (E , mg. s⁻¹)
- Effective CO₂ diffusion coefficient (D_{EFF} , cm².s⁻¹)
- CO₂ increase rate (RI_{DOUBLE} , mg.m⁻³.s⁻¹)
- CO₂ retaining ratio ($M_{\text{RET}}/M_{\text{T}}$, % by weight)

The results show that the proposed method is promising. The combined interpretation of the data obtained in terms of these measurable parameters is useful to define the CO₂ reduction performance with focus on their CO₂ diffusion and CO₂ retaining performances. The CO₂ diffusion through a building material is measured in terms of RD_{SINGLE} and that data is used to determine the D_{EFF} value. On the other hand, the CO₂ retaining behavior of the material is determined in terms of $M_{\text{RET}}/M_{\text{T}}$. The D_{EFF} value has to be evaluated together with the $M_{\text{RET}}/M_{\text{T}}$ value in order to better interpret the CO₂ diffusion characteristics of building materials and to discuss their potential of self-ventilation in reducing occupant related indoor air contamination. In short, the reference data on CO₂ reduction performances of building materials can be established by using this practical and repeatable test method.

Further studies are needed to comprehensively investigate the contribution of self-ventilation behavior of building materials to healthier indoor air. The proposed method can be adapted and further developed for indoor air pollutants besides CO₂ such as, volatile organic compounds. Reference data on CO₂ reduction performances of various building materials and multi-layered wall components can be established by using this practical testing method. This is a promising interdisciplinary research area that will also advance indoor air quality modeling and simulation analyses. In

conclusion, this study is the pioneer of a sustainable future where indoor air cleaning and self-ventilating in a passive manner is a standard feature of building envelopes.

BIBLIOGRAPHY

- AKKUZUGİL, E. (1997) *A study in historical plasters*, unpublished Master's Thesis, Department of Architecture, ODTÜ, Ankara.
- ANSI/ASHRAE 62.1-2016 (2016) *Ventilation for Acceptable Indoor Air Quality*, American Society of Heating, Refrigerating and Air Conditioning Engineers, Atlanta GA.
- ASTM D6245-18 (2018) *Standard Guide for Using Indoor Carbon Dioxide Concentrations to Evaluate Indoor Air Quality and Ventilation*, American Society for Testing and Materials, Philadelphia.
- ASTM E741-11 (2017) *Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution*, American Society for Testing and Materials, Philadelphia.
- ASTM E96/E96M-16 (2016) *Water Vapour Transmission of Materials*, The American Society for Testing and Materials, Philadelphia.
- ASHRAE (2020) *Epidemic Task Force Laboratory Subcommittee Guidance Document*. [<https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-etf---lab-guidance.pdf>] Access Date (26.04.2022).
- BATOG P., BADURA M. (2013) Dynamic of Changes in Carbon Dioxide Concentration in Bedrooms. In: *11th International Conference on Modern Building Materials, Structures and Techniques, MBMST 2013, Procedia Engineering* (57) 175-82.
- BELMONTE, J. F., BARBOSA, R., ALMEIDA, M.G. (2019) CO₂ Concentrations in a Multifamily Building in Porto, Portugal: Occupants' Exposure and Differential Performance of Mechanical Ventilation Control Strategies, *J. Build. Eng.*, (23) 114–26. -
- BENAVENTE, D., PLA, C. (2018) Effect of Pore Structure and Moisture Content on Gas Diffusion and Permeability in Porous Building Stones, *Materials and Structures* 51(1) 1-14.
- BOGUSKI, T.K. (2006) Understanding Units of Measurement. *Environmental Science and Technology Briefs for Citizens, Issue 2*. [https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.files/fileID/14285] Access Date (26.04.2022).
- BRITISH-GYPSUM (N. D.) *Create Healthier Indoor Spaces with ACTIVair® Technology*. [<https://www.british-gypsum.com/specification/create-healthier-indoor-spaces-activair-technology>] Access Date (26.04.2022).
- BULUT, H. (2012) Havalandırma ve İç Hava Kalitesi Açısından CO₂ Miktarının Analizi (In English: Assessment of the Amount of CO₂ in Relation to Ventilation and Indoor Air Quality). In: *X. Ulusal Tesisat Mühendisliği Kongresi* (In English: 10th National Installation Engineering Congress), İzmir, Turkey, 11-16 April 2011, pp. 1679-1689. TMMOB Makina Mühendisleri Odası, İzmir [<http://www.mmoteskon.org/wp-content/uploads/teskonkitaplar/teskon2011/teskon2011-Cilt2.pdf>] Access Date (26.04.2022).

- CANDANEDO L.M., FELDHEIM, V. (2016) Accurate Occupancy Detection of an Office Room from Light, Temperature, Humidity and CO₂ Measurements using Statistical Learning Models, *Energy and Buildings* (112) 28-39.
- CANHA N., MANDIN C., RAMALHO O., WYART G., RIBÉRON J., DASSONVILLE C., HANNINEN O., ALMEIDA S.M., DERBEZ M. (2016) Assessment of Ventilation and Indoor Air Pollutants in Nursery and Elementary Schools in France, *Indoor Air* (26) 350-65.
- CANER, E. (2003) *Archaeometrical Investigation of some Seljuk Plasters*, unpublished Master's Thesis, Department of Architecture, ODTÜ, Ankara.
- CDPH (2017) *Standard Method for The Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2*. California Department of Public Health, USA. [https://www.cdph.ca.gov/Programs/CCDCPHP/DEODC/EHLB/IAQ/CDPH%20Document%20Library/CDPH-IAQ_StandardMethod_V1_2_2017_ADA.pdf] Access Date (26.04.2022).
- CLEMENTS-CROOME, D. J. (2004) *Intelligent Buildings: Design, Management and Operation*, Thomas Telford, London.
- CORSI R.L., TORRES V.M., SANDERS M. KINNEY K.A. (2002) Carbon dioxide Levels and Dynamics in Elementary Schools: Results of the TESIAs Study. In: *Indoor Air '02: Proceedings of the 9th International Conference on Indoor Air Quality and Climate*, Monterey, CA, 30 June – 5 July 2002, 74-79.
- COTTERELL, J., DADEBY, A. (2013) *The Passivhaus Handbook: A Practical Guide to Constructing and Retrofitting Buildings for Ultra-Low Energy Performance*, UIT/Green Books, Cambridge.
- CUSSLER, E.L. (1997) *Mass Transfer for Fluid Systems*, Cambridge University Press, UK.
- DERBEZ, M., BERTHINEAU, B., COCHET, V., PIGNON, C., RIBÉRON, J., WYART, G., MANDIN, C., KIRCHNER, S. (2014) A 3-year Follow-up of Indoor Air Quality and Comfort in Two Energy-efficient Houses, *Building and Environment*, (82) 288-99.
- DIN EN ISO 12572 (2017) *Hygrothermal Performance of Building Materials and Products - Determination of Water Vapour Transmission Properties - Cup Method*, Deutsches Institut für Normung E.V., Berlin.
- ECDC (2020) *Heating, Ventilation and Air-conditioning Systems in the Context of COVID-19*, European Centre for Disease Prevention and Control, Stockholm. [<https://www.ecdc.europa.eu/en/publications-data/heating-ventilation-air-conditioning-systems-covid-19>] Access Date (26.04.2022).
- ELSAID A.M., AHMED, M. S. (2021) Indoor Air Quality Strategies for Air-Conditioning and Ventilation Systems with the Spread of the Global Coronavirus (COVID-19) Epidemic: Improvements and Recommendations, *Environ Res* (199) 111314.
- EN 13779:2007 (2007) *Ventilation for Non-residential Buildings - performance Requirements for Ventilation and Room-conditioning Systems*, European Committee for Standardization, Brussels.

- EN 16798-3:2017 (2017) *Energy Performance of Buildings - Ventilation for Buildings - Part 3: For Non-Residential Buildings – Performance Requirements for Ventilation and Room-conditioning Systems (Modules M5-1, M5-4)*, European Committee for Standardization, Brussels.
- EPA (2019) *Indoor Air Pollution: An Introduction for Health Professionals*, Environmental Protection Agency [<https://www.epa.gov/indoor-air-quality-iaq/indoor-air-pollution-introduction-health-professionals>] Access Date (26.04.2022).
- ESEN, S., TUNÇ, N., TELATAR, S., TAVUKÇUOĞLU, A., CANER-SALTIK, E.N., DEMİRCİ, Ş. (2004) Manisa Çukur Hamam'ın Onarımına Yönelik Malzeme Çalışmaları. In, 2. *Ulusal Yapı Malzemesi Kongresi ve Sergisi*, İstanbul, Türkiye, 6-8 October 2004 (pp. 494-505). İstanbul, Turkey: TMMOB Chamber of Architects - Istanbul Branch.
- ESFA (2018) *BB 101: Ventilation, Thermal Comfort and Indoor Air Quality 2018*, Education and Skills Funding Agency [<https://www.gov.uk/government/publications/building-bulletin-101-ventilation-for-school-buildings>] Access Date (26.04.2022).
- FANGER, P. O. (1998) Discomfort Caused by Odorants and Irritants in the Air, *Indoor Air*, (Suppl.4) 81-6.
- FEIST, W., SCHNEIDERS, J., DORER, V., HAAS, A. (2005) Re-inventing Air Heating: Convenient and Comfortable within the Frame of the Passive House Concept, *Energy and Buildings* (37) 1186-203.
- FISK, W.J., ROSENFELD, A. H., (1997) Estimates of Improved Productivity and Health from Better Indoor Environments, *Indoor Air* (7) 158-72.
- FISK, W.J., SULLIVAN, D.P., FAULKNER, D., ELISEEVA, E. (2010) *CO₂ Monitoring for Demand Controlled Ventilation in Commercial Buildings*. Research Report: LBNL-3279E, Lawrence Berkeley National Laboratory, Berkeley, CA.
- FROMME H., TWARDILLA D., DIETRICH S., HEITMANN D., SCHIERL R., LIEBL B., RÜDEN H. (2007) Particulate Matter in the Indoor Air of Classrooms – Exploratory Results from Munich and Surrounding Area, *Atmospheric Environment* (41) 854-66.
- GAIHRE, S., SEMPLE, S., MILLER, J., FIELDING, S., TURNER, S. (2014) Classroom Carbon Dioxide Concentration, School Attendance, and Educational Attainment, *Journal of Social Health* 84(9) 569-74.
- GEI (2010) *Indoor Air Quality (IAQ) Standard for Building Materials, Finishes and Furnishings*, GREENGUARD Environmental Institute, Georgia, USA. [http://greenguard.org/Libraries/GG_Documents/GGPS_001_GREENGUARD_Standard_for_Building_Materials_Finishes_and_Furnishings_2.sflb.ashx] Access Date (26.04.2022).
- GRUBER, P., GOSZTONYI, S. (2010) Skin in Architecture: Towards Bioinspired Facades, *WIT Trans Ecol Envir* (138) 503–13.
- HEIDARI, L., YOUNGER, M., CHANDLER, G., GOOCH, J., SCHRAMM, P. (2017) Integrating Health into Buildings of the Future, *Journal of Solar Energy Engineering* 139(1) 010802.
- HOUBEN, H., GUILLAUD, H. (1989) *Earth construction*, Intermediate Technology Publications, London.

- HUANG, Q., MAO, C. (2016) Occupancy Estimation in Smart Building Using Hybrid CO₂/Light Wireless Sensor Network, *Journal of Applied Sciences and Arts* 1(2) article 5.
- IOM (2011) *Climate Change, the Indoor Environment and Health*, The National Academies Press, Washington DC.
- JACOBS, M.H. (1967) *Diffusion process*, Julius Springer, Berlin.
- KAJTAR, L., HERCZEG, L. (2012) Influence of Carbon-dioxide Concentration on Human Well-being and Intensity of Mental Work, *Quarterly Journal of the Hungarian Meteorological Service* 116(2) 145-69.
- KEEFE, L. (2005) *Earth Building - Methods and materials, Repair and Conservation*, Taylor and Francis, New York.
- KIM, J.-L., ELFMAN, L., WIESLANDER, G., FERM, M., TOREN, K., NORBACK, D. (2011) Respiratory Health among Korean Pupils in Relation to Home, School and Outdoor Environment, *Journal of Korean Medical Sciences* (26) 166-73.
- KÖMÜRÇÜOĞLU, E.A. (1962) *Yapı Malzemesi Olarak Kerpiç ve Kerpiç İnşaat Sistemleri*, İTÜ Matbaası, İstanbul.
- KUS, H., CARLSSON, T. (2003) Microstructural Investigations of Naturally and Artificially Weathered Autoclaved Aerated Concrete, *Cement and Concrete Research* (33) 1423-32.
- LAHRZ, T., BISCHOF, W., SAGUNSKI, H. (2008) Gesundheitliche Bewertung von Kohlendioxid in der Innerraumluft. Mitteilungen der Ad-hoc-Arbeitsgruppe Innenraumrichtwerte der Innenraumlufthygiene-Kommission des Umweltbundesamtes und der Obersten Landesgesundheitsbehörden, *Bundesgesundheitsblatt Gesundheitsforsch Gesundheitschutz* (51) 1358-69.
- MASSARI, G., MASSARI, I. (1993) *Damp Buildings, Old and New*, ICCROM, Rome.
- MATSUSHITA, F., AONO, Y., SHIBATA, S. (2000) Carbonation Degree of Autoclaved Aerated Concrete. *Cement and Concrete Research* (30) 1741-5.
- MATSUSHITA, F., AONO, Y., SHIBATA, S. (2004) Calcium Silicate Structure and Carbonation Shrinkage of a Tobermorite-based Material, *Cement and Concrete Research* (34) 1251-7.
- MAZZARELLA, L., HOGELING, J. (2018) CEN Standard EN 16798-3:2017 on Ventilation for Non-residential Buildings: Performance Requirements, *REHVA Journal* (April 2018) 6-12.
- MERİÇ, I., ERDİL M., MADANI, N., ALAM, B.A., TAVUKÇUOĞLU, A., CANER-SALTIK, E. (2013) Technological Properties of Earthen Building Materials in Traditional Timber Frame Structures, In: *Kerpic'13 3rd International Conference – New Generation Earthen Architecture: Learning from Heritage*, İstanbul, Turkey, 11-15 September 2013, 465-73. İstanbul Aydın University, İstanbul.
- MERİÇ, I., ERDİL, M., MADANI, N., ALAM, B.A., TAVUKÇUOĞLU, A., CANER-SALTIK, E. (2014) Material Characterization of Mudbrick and Neighbouring Plasters in Traditional Timber Framed Structures, In: *MONUBASIN 9- 9th International Symposium on the Conservation of Monuments in the Mediterranean Basin*

- Improvements in Conservation and Rehabilitation – Integrated Methodologies, Ankara, Turkey, 3-5 June 2014 259-272. METU Faculty of Architecture, Ankara.
- MIHELICIC, J.R., ZIMMERMAN, J.B., ZHANG, Q., STUART, A.L., MILKE, M.W., WHITMAN, B.E., PENN, M.R., AUER, M.T., HAND, D.W., HONRATH, R.E., URBAN, N.R. (2021) *Environmental Engineering: Fundamentals, Sustainability, Design* (3rd edition), John Wiley & Sons.
- MLAKAR, J. AND ŠTRANCAR, J. (2013) Temperature and Humidity Profiles in Passive-house Building Blocks, *Building and Environment* (60) 185-93.
- MOCHALSKI, P., RUDNICKA, J., AGAPIOU, A., STATHEROPOULOS, M., AMANN, A., BUSZEWSKI, B. (2013) Near real-time VOCs Analysis Using an Aspiration Ion Mobility Spectrometer, *Journal of Breath Research* 7(2) 026002.
- MOCHALSKI, P., KING, J., UNTERKOFER, K., HINTERHUBER, H., AMANN, A. (2014) Emission Rates of Selected Volatile Organic Compounds from Skin of Healthy Volunteers, *Journal of Chromatography B* (959) 62–70.
- MOCHALSKI, P., WIESENHOFER, H., ALLERS, M., ZIMMERMANN, S., GÜNTNER, A. T., PINEAU, N. J., RUZSANYI, V. (2018) Monitoring of Selected Skin- and Breath-borne Volatile Organic Compounds Emitted from the Human Body Using Gas Chromatography Ion Mobility Spectrometry (GC-IMS), *Journal of Chromatography B* (1076) 29–34.
- MORTON, T. (2008) *Earth Masonry Design and Construction Guidelines*, IHS BRE Press, Berkshire.
- MUSCATIELLO, N., MCCARTHY, A., KIELB, C., HSU, W.-H., HWANG, S.-A., LIN, S. (2015) Classroom Conditions and CO₂ Concentrations and Teacher Health Symptom Reporting in 10 New York State Schools. *Indoor Air* (25) 157-167.
- NAMOULNIARA, K., TURCRY, P., AÏT-MOKHTAR, A. (2016) Measurement of CO₂ Effective Diffusion Coefficient of Cementitious Materials, *European Journal of Environmental and Civil Engineering* 20(10) 1183-96.
- NIEMELÄ, T., VINHA, J., LINDBERG, R., RUUSKA, T., LAUKKARINEN, A. (2017) Carbon dioxide Permeability of Building Materials and their Impact on Bedroom Ventilation Need, *Journal of Building Engineering* (12) 99-108.
- ÖRS, K. (2006) *An Investigation on Compatibility Properties of Exterior Finish Coats for Insulated Walls in terms of Water Vapor Permeability and Modulus of Elasticity*, unpublished Master's Thesis, Department of Architecture, ODTÜ, Ankara.
- ÖZTOPRAK, Z. (2018) *A Biomimetic Perspective on (Retro)Fitting of Building Envelopes*, unpublished Master's Thesis, Department of Architecture, ODTÜ, Ankara.
- PETERSEN, S., JENSEN, K.L., PEDERSEN, A.L.S., RASMUSSEN, H.S. (2016) The Effect of Increased Classroom Ventilation rate Indicated by Reduced CO₂ Concentration on the Performance of Schoolwork by Children, *Indoor Air* (26) 366-79.

- PHI (2013) *Certified Passive House Certification Criteria for Residential Passive House Buildings*, Passive House Institute. [https://passiv.de/downloads/03_certification_criteria_residential_en.pdf] Access Date (26.04.2022).
- PHILLIPS, M., HERRERA, J., KRISHNAN, S., ZAIN, M., GREENBERG, J., CATANEO, R.N. (1999) Variation in Volatile Organic Compounds in the Breath of Normal Humans, *Journal of Chromatography* (729) 75-88.
- POHL, G., NACHTIGALL, W. (2015) *Biomimetics for Architecture and Design*, Springer, Switzerland.
- PUCCI, O., QUALLS, C., BATTISTI-CHARBONNEY, A., BALABAN, D.Y., FISHER, J.A., DUFFIN, J., APPANZELLER, O. (2012) Human Skin Hypoxia Modulates Cerebrovascular and Autonomic Functions, *Plos One* (7) 10, e47116.
- PUKHKAL, V., TANIC, M., VATIN, N., MURGUL, V. (2015) Studying Humidity Conditions in the Design of Building Envelopes of "Passive House" (in the case of Serbia). International Scientific Conference Urban Civil Engineering and Municipal Facilities, SPbUCEMF-201. *Procedia Engineering* (117) 859-64.
- REHVA (2021) *REHVA COVID-19 Guidance Document: How to Operate HVAC and Other Building Service Systems to Prevent the Spread of the Coronavirus (SARS-CoV-2) Disease(COVID-19) in Workplaces*. [https://www.rehva.eu/fileadmin/user_upload/REHVA_COVID-19_guidance_document_V4_23112020.pdf] Access Date (26.04.2022).
- RICHARDSON, B. A. (2001) *Defects and Deterioration in Buildings*, Spon Press, London and New York.
- ROLLE K.C. (2016) *Heat and Mass Transfer* Cengage Learning, Boston.
- ŠADAUSKIENE, J., STANKEVICIUS, V., BLIUDZIUS, R., GAILIUS, A. (2009) The Impact of the Exterior Painted Thin-layer Render's Water Vapour and Liquid Water Permeability on the Wall Insulating System, *Construction and Building Materials* 23(8) 2788-94.
- SAKAGUCHI, J., AKABAYASHI, S. (2003) Field Survey of Indoor Air Quality in Detached Houses in Niigata Prefecture, *Indoor Air* 13 (Suppl. 6) 42-9.
- SAMET, J. M., SPENGLER, J.D., (2003) Indoor Environments and Health: Moving into the 21st Century, *American Journal of Public Health*, 93(9) 1489-93.
- SASSI, P. (2013) A Natural Ventilation Alternative to the Passivhaus Standard for a Mild Maritime Climate, *Buildings* (3) 61-78.
- SATISH, U., MENDELL, M.J., SHEKHAR, K., HOTCHI, T., SULLIVAN, D., STREUFERT, S., FISK, W.J. (2012) Is CO₂ an Indoor Pollutant? Direct Effects of Low-to-Moderate CO₂ Concentrations on Human Decision-Making Performance, *Environmental Health Perspectives* 120(12) 1671-7.
- SCHIBUOLA, L., TAMBANI, C. (2019) "Indoor Environmental Quality Classification of School Environments by Monitoring PM and CO₂ Concentration Levels", *Atmos Pollut Res* 11(2) 332-42.
- SHIN, M.-S., RHEE, K.-N., LEE, E.-T., JUNG, G.-J. (2018) Performance Evaluation of CO₂-based Ventilation Control to Reduce CO₂

- Concentration and Condensation Risk in Residential Buildings, *Building and Environment* (142) 451-63.
- STROTHER, E.F., WILLIAM, C.T. (1990) *Thermal Insulation Building Guide*. Robert E. Krieger Publishing Company, Florida.
- STÜCKER, M., STRUK, A., ALTMAYER, P., HERDE, M., BAUMGÄRTL, H., LÜBBERS, D.W. (2002) The Cutaneous Uptake of Atmospheric Oxygen Contributes Significantly to the Oxygen Supply of Human Dermis and Epidermis, *Journal of Physiology* 538(3) 985-94.
- TAVUKÇUOĞLU, A., ÖRS, K., DÜZGÜNEŞ, A., DEMIRCI, Ş. (2013) Compatibility Assessment of Exterior Finish Coats for Insulated Walls, *METU Journal of the Faculty of Architecture* 30(1) 79-97.
- TS EN ISO 7783:2015 (2015) Paints and Varnishes - Determination of Water-vapour Transmission Properties - Cup method, Türk Standartları Enstitüsü, Ankara.
- TWARDELLA, D., MATZEN, W., LAHRZ, T., BURGHARDT, R., SPEGEL, H., HENDROWARSITO, L., FRENZEL, A.C. FROMME, H. (2012) Effect of Classroom Air Quality on Student's Concentration: Results of a Cluster-randomized Cross-over Experimental Study, *Indoor Air* (22) 378-87.
- VAN DER WAL, J.F., MOONS, A.M.M., CORNELISSEN, H.J.M. (1991) Indoor air quality in renovated Dutch homes, *Indoor Air*, (4) 621-33.
- VILČEKOVÁ, S., KAPALOB, P., MEČIAROVÁ, L., KRÍDLOVÁ, BURDOVÁ, E., IMRECZEOVÁ, V. (2017) Investigation of Indoor Environment Quality in Classroom - Case Study, *Procedia Engineering* (190) 496-503.
- WALDEN, S. (2018) *The 'Indoor Generation' and the Health Risks of Spending More Time inside*, USA Today, May 15, 2018. [<https://www.usatoday.com/story/sponsor-story/velux/2018/05/15/indoor-generation-and-health-risks-spending-more-time-inside/610289002/>] Access Date (26.04.2022).
- WELTY, J.R., RORRER, G.L., FOSTER, D.G. (2019) *Fundamentals of Momentum, Heat and Mass Transfer*, Wiley, Hoboken, NJ.
- WHITMORE, C.A., CLAYTON, A., AKLAND, A. (2003) *California Portable Classrooms Study, Phase II: Main Study, Final Report, Volume II. Research Triangle Park, NC: RTI International*. [https://ww3.arb.ca.gov/research/indoor/pes/pes-fr_new/pes_v2_ph2_main_03-23-04.pdf] Access Date (26.04.2022).
- WHO (2000) *The Right to Healthy Indoor Air; Report on World Health Organization Meeting Bilthoven, Netherlands, May 15-17, 2000*. [<https://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/pre2009/the-right-to-healthy-indoor-air>] Access Date (26.04.2022).
- WILSON, S., CARD, G., HAINES, S. (2009) *Ground Gas Handbook*, InPrint, Latvia.
- WILLIAMS, J. (2012) *Zero-Carbon Homes: A Road Map*, Routledge, London.
- YANG, L., YE, M., HE, B.-J. (2014) CFD Simulation Research on Residential Indoor Air Quality, *Science of the Total Environment* (472) 1137-44.

YÜNCÜ, B., TAVUKÇUOĞLU, A., CANER-SALTIK, E. N. (2014) *Breathing Features Assessment of Porous Wall Units in Relation to Indoor Air Quality, 35th AIVC, Poznan, Poland, 24-25 September 2014 (Proceedings book)* [<https://www.aivc.org/sites/default/files/87.pdf>] Access Date (26.04.2022).

YÜNCÜ, B. (2016) *Assessment of Carbon Dioxide Transmission through Porous Building Materials in Relation to Indoor Air Quality*, unpublished Master's Thesis, Department of Architecture, ODTÜ, Ankara.

ABBREVIATIONS

A: Area of the plane perpendicular to the direction of diffusion, cm²

AAC: Autoclaved aerated concrete

AAC/G2: Autoclaved aerated concrete infill unit

AAC/G4: Autoclaved aerated concrete load bearing unit

C: CO₂ concentration, ppm, mg.m⁻³

C_{IN}: The indoor CO₂ concentration level, ppm

C_{OUT}: The outdoor CO₂ concentration level, ppm

C_{SOURCE}: CO₂ concentration at the source, mg.m⁻³

C₀: Concentration at the destination, mg.m⁻³

ΔC: Difference between C_{IN} and C_{OUT} ppm)

D_{EFF}: Effective diffusion coefficient of CO₂ in the building material, cm².s⁻¹

E: CO₂ diffusion rate, mg.s⁻¹

IAQ: Indoor air quality.

L: Thickness of the building material which diffusion occurs through, cm

M_{CH1-I}: Initial amount of CO₂ in Chamber-1, mg

M_{CH1-S}: Amount of CO₂ generated by the CO₂ source in Chamber-1, mg

M_{CH2-I}: Initial amount of CO₂ in Chamber-2, mg

M_{CH1-F}: Final amount of CO₂ in Chamber-1 by the end of 24h test duration, mg

M_{CH2-F}: Final amount of CO₂ in Chamber-2 by the end of 24h test duration, mg

M_{RET}: Amount of CO₂ retained by the material sample by the end of 24h test duration, mg

M_{RET}/M_T: CO₂ retaining ratio, % by weight

M_T: Total amount of CO₂ in the closed system, mg

MW: Molecular weight, g/mole

NA: Not applicable

RD_{SINGLE}: CO₂ concentration decay rate in the single-chamber, mg.m⁻³.s⁻¹

RI_{DOUBLE}: CO₂ concentration increase rate in Chamber-2 in the double-chamber test setup

SBS: Sick building syndrome

V: Volume of a chamber, m³

VAC: Ventilation and air conditioning

VOC: Volatile organic compound

Alındı: 27.04.2022; Son Metin: 09.03.2023

Anahtar Sözcükler: Karbondioksit difüzyon deneyi; yapı malzemeleri; CO₂ azaltma performansı; iç hava kalitesi; etkin CO₂ difüzyon katsayısı; CO₂ tutma davranışı.

BİNA ÇEPERİNİN DOLU KISIMLARINDAN BEKLENENLERİ DEĞİŞTİREN YENİ BİR YAKLAŞIM: YAPI MALZEMELERİNİN KARBONDİOKSİT DİFÜZYON VE TUTMA PERFORMANSLARININ TEST EDİLMESİ

COVID-19 salgını, tüm dünyaya iç mekan hava kalitesinin ne kadar hayati olduğu göstermiştir. Dolayısıyla, sağlıklı ve sürdürülebilir iç ortamlar için "nefes alabilen bina kabuğu" yaklaşımı, yapı bilimi camiasının dikkatini hak eden önemli bir husustur. Hava sızdırmayan bina kabuğu tasarımlarının aksine, "nefes alabilen kabuk" yaklaşımı, bir bina çeperinin dolu kısımlarından beklenenleri değiştirir. Bu araştırma ile yeni bir bakış açısı, yeni ölçülebilir parametreler ve yeni bir pratik test yöntemi sunulmaktadır. Burada, iç hava kalitesini artırmak amacıyla, yapı malzemelerinin kirletici azaltma ve kendi kendini havalandırma potansiyellerinden faydalanılması hususuna odaklanan bir bakış açısı sunulmaktadır. Bu kapsamda, bina çeperinin dolu kısımlarında kullanılan yapı malzemelerinin kirletici azaltma (difüzyon ve tutma) performansını ölçmek için test yöntemleri geliştirmek gerekir. Binalarda, kullanıcı kaynaklı iç hava kirleticileri arasında CO₂, iyi bilinen ve iç hava kalitesini değerlendirmek için yaygın olarak kullanılan göstergelerden biridir. Bu çalışmada, yapı malzemelerinin iç ortamdaki CO₂ miktarını azaltma performansını ölçebilen standart bir test yöntemi önerilmiş; bu yöntemle elde edilen verilerin analizi için "CO₂ konsantrasyon düşüş hızı", "etkin CO₂ difüzyon katsayısı" ve "CO₂ tutma oranı" olmak üzere üç ölçülebilir parametre tanımlanmıştır. Önerilen test yönteminin deney düzeneği ve veri analizi ile ilgili prosedürleri açıklamak amacıyla, kerpiç ve gazbeton olmak üzere seçilen iki nefes alan ve çok gözenekli kağır yapı malzemesi üzerinde yapılan örnek ölçümler ve analizleri ayrıntılarıyla sunulmuştur. Bu test yöntemi ve düzeneği, tek odacıklı ve çift odacıklı difüzyon deneylerinin birlikte kullanımını içermektedir. Tek odacıklı düzenek, gözenekli bir malzemedan CO₂ geçişine izin veren ve CO₂ konsantrasyon düşüş hızını ölçen bir sistemdir. Çift odacıklı deney düzeneği ise, CO₂ kaçışını önleyen kapalı bir sistemdir ve CO₂ tutma davranışının CO₂ konsantrasyon düşüş hızı üzerindeki etkisini ölçer. Bu verilerin birlikte yorumlanması, malzemelerin iç mekan CO₂ konsantrasyonlarını azaltma performanslarının tartışılmasına olanak verir. Bu pratik deney yöntemi yaygın kullanıldıkça, yapı malzemelerinin CO₂ azaltma performansları hakkında ölçülebilir parametreler üzerinden referans verilerin üretilebilmesi mümkün olacak ve nefes alabilen bina kabuğu tasarımları için bilimsel değerlendirmeler ilerleyebilecektir.

A NEW APPROACH CHANGING EXPECTATIONS FROM SOLID PARTS OF BUILDING ENVELOPES: TESTING THE CARBON DIOXIDE DIFFUSION AND RETAINING PERFORMANCES OF BUILDING MATERIALS (1)

The COVID-19 pandemic has made the world realize how vital indoor air quality is. For healthy and sustainable indoor environments, the "breathable building skin" approach deserves the attention of the building science community. In contrast to the common approach of airtight buildings, the "breathable skin" approach changes what is expected from the solid parts of a building envelope. Here, a new approach, new measurable parameters, and a new practical testing method are presented. Benefitting from the pollutant reduction and self-ventilation potentials of building materials is a new approach introduced here for enhancing indoor air quality. The effectiveness assessment of that approach requires developing testing methods for measuring the pollutant reduction (diffusion and retaining) performance of building materials. Among the occupant-related indoor air pollutants, CO₂ is well-known and one of the widely-used indicators for assessing indoor air quality. The testing method proposed in this study assesses CO₂ reduction performance of building materials in terms of "CO₂ concentration decay rate," "effective CO₂ diffusion coefficient," and "CO₂ retaining ratio" as the related measurable parameters. Sample use of the testing method conducted on adobe and autoclaved aerated concrete was presented to explain the proposed testing procedure. This procedure involved the combined use of single-chamber and double-chamber diffusion tests. The single-chamber setup is a system that permits CO₂ transmission through a porous material and measures the CO₂ concentration decay rate. The double-chamber setup is a closed system that prevents CO₂ from escaping thereupon measures the impact of CO₂ retaining behavior on CO₂ concentration decay rate. Joint interpretation of the data allows discussing the potentials and limitations of materials in reducing indoor CO₂ concentrations. For further evaluations, this practical testing method is useful in producing reference data on CO₂ reduction performances of building materials.

BAŐAK YŪNCŪ KARANFİL; B.Arch, M.Sc.

Received her B.Arch and MSc. in building science from Middle East Technical University Faculty of Architecture (2011- 2016). Currently a PhD candidate in Graduate Program in Building Science at Middle East Technical University. Major research interests include building materials, indoor air quality and sustainability in built environment. basakyuncu@gmail.com

AYŐE TAVUKŐUOĐLU; B.Arch, M.Sc., PhD.

Received her B.Arch, MSc. and PhD degree in Building Science from Middle East Technical University Faculty of Architecture (1989 – 1992 – 2001). Major research interests include nondestructive testing for diagnostic and monitoring purposes, in-situ assessment of moisture, thermal and material failures in buildings, technological properties analyses of building materials, nano dispersive conservation treatments, and innovative mortars for repair and contemporary uses. aysetavukcuoglu@yahoo.com

DESIGN AND COUNTER DESIGN AGAINST CONSUMPTION: 1972 "ITALY, THE NEW DOMESTIC LANDSCAPE" EXHIBITION (1)

Aysu BOYSAN*, Gülru MUTLU TUNCA**

Received: 13.05.2022; Final Text: 06.06.2023

Keywords: Radical designers; consumerism; mass production; consumer society; environments and counter environments.

1. This paper is an intense study based on the arguments derived from the MS thesis of Aysu Boysan, entitled "Design and Counter Design against Consumption: 'The New Domestic Landscape' Exhibition," supervised by Gülru Mutlu Tunca.

INTRODUCTION

The culture industry perpetually cheats its consumers on what it perpetually promises. The promissory note, which, with its plots and staging, it draws on pleasure is endlessly prolonged; the promise, which is actually all the spectacle consists of, is illusory: all it actually confirms is that the real point will never be reached that the diner must be satisfied with the menu.

Theodor Adorno, Max Horkheimer, *Dialectic of Enlightenment: Philosophical Fragments* (1969,139)

Architects and designers have debated consumerism and its effect on the production and design of cultural content since Adorno and Horkheimer first claimed in their 1947 essay "The Culture Industry: Enlightenment as Mass Deception" that culture and cultural products became commodities of the constant reproduction and legitimization progress of capitalism and industrial society. Nevertheless, the discussions have never been as intense as in the 1960s and 1970s European intelligentsia, when the economic boom amplified the controversial progress of mass production and consumption. One of the first instances of this highly critical and political intellect's dissemination on the other side of the ocean was through the 1972 cutting-edge exhibition "Italy: The New Domestic Landscape" (INDL), held in the Museum of Modern Art, New York (MoMA, NY), which had broad repercussions on the architecture and design circles of the day in both continents; hence has a tremendous impact on that of today beyond dispute. The young Argentinean architect and designer Emilio Ambasz (1943-), the Design Curator of MoMA, curated the exhibition to introduce American society to the rising star of Italian design through "objects" he collected and "environments" designed and produced solely for this exhibition. Identifying Italian design as the precursor of a unique, colorful, sensuous, and "hedonistic" style, Ambasz aimed to "honor" a selected repertoire in New York and analyze the "diversity" behind responses

* Department of Interior Architecture, Faculty of Architecture, Çankaya University, Ankara, TÜRKİYE.

** Corresponding Author; Department of Interior Architecture, Faculty of Architecture, Çankaya University, Ankara, TÜRKİYE.

developed for solving current socio-cultural problems affecting design (Ambasz, 1972, 11).

For the show, Ambasz riddled the MoMA's garden with one hundred eighty objects of prominent Italian designers, distributed by notable manufacturers, each representing the ongoing commercial success of the Italian consumer goods industry. Nevertheless, the show's reputation was due to eleven experimental environments exhibited inside the galleries, designed solely for this exhibition. American intellectuals first recognized how 'diverse' Italian designers approached the domestic environment through this handful of experimental designs determined by Ambasz's design program limits. All criticized the ideological production of design and architecture as a means of cultural domination in one way or another. Nevertheless, the literature on the exhibition's significance and its hallmark condensed on—though some might consider it a bias—the radical aspect of the event and protesting “anti-design” approaches, representing the extreme Marxist and Leftist mindset behind it (Mutlu Tunca, 2013; Wilson & Curl, 2015).

The 1972 INDL show was Ambasz's masterpiece: the political pessimism of Radical thoughts and the exceptionally provocative and critical discourse impressed Ambasz and his colleagues (Mutlu Tunca, 2013). Since Ambasz was disappointed with the Bauhaus mainstream and the functionalist attitude in industrial design, he searched for a way out that transformed the traditional status of object into a social entity, reshaped by its “larger natural and socio-cultural environment.” Ambasz conceived the Italian case, which had become one of the dominant forces in the creation and criticism of the design, as a “micromodel” offering a “wide range of the possibilities, limitations and critical issues of contemporary design” (Ambasz, 1972, 19). Assertive with the American public's “love” of Italian designers' unique achievements, Ambasz trivialized the eclipse of the hedonistic design world he adored by the severe and provocative discourses of Radical figures, denouncing consumption as the cause of death for architecture and design disciplines (Collard, personal communication with Ambasz, 2012).

Functionalism and the Bauhaus mainstream, the prevailing architectural phenomenon of 1920s Europe, were exiled belatedly to the United States. The immigration of Bauhaus masters coincided with the post-World War II years (1940 to 1970), the Consumer Era period in American history when American society's prosperity and affluence were at their highest level. Nevertheless, the doctrine of “affluent society,” grounded particularly on consumerism—as examined by the economist and author John Kenneth Galbraith in his 1958 book *The Affluent Society*—conflicted with the phenomenon of Functionalism. While the former required an escalating industrial production to satisfy consumer demands, the latter was prone to “reduce the number of objects and implement the optimum ratio between the products and the [user] needs for them” (Koveshnikova et al., 2016, 3287). The conflict between the demands of postwar consumer culture and functionalist ideals swayed the crisis in American architectural and design practice towards a consumption-exalter intellect. Italian architectural historian and theoretician Manfredo Tafuri (1935-1994), who contributed to the exhibition catalog with a critical article on Italian design, blamed this state of mind for the “death of architecture” (Tafuri, 1998). Michael Hays, an American architectural historian/theoretician, introduced Tafuri's tragic projection in his seminal anthology, *Architectural Theory after 1968* (1998) as:

[Tafari saw] architecture not as just the victim of demolition work done on cultural codes by functionalism and instrumentalizing methodologies or by commodification and reification, but as inseparable from and indeed, complicitous with quantification by the commodity system that began in the nineteenth century and had arrived fully geared up in the postwar consumer culture of America. (Hays, 1998, 24)

Ambasz had discovered a highly stylistic design practice in Italy, despite the ongoing disputes on consumerism's domination of the very discipline. For Italian art historian and critic Germano Celant (1940-)—referring to his essay “Radical Architecture” written for the “Critical Articles” section in the exhibition catalog—the design approaches in Italy toward consumer ideology were polarized on two diverse tracks: While some glorified the “manufactured object and the constructed building as the sole and inevitable bases for their activity,” a selected body, which he called the Radicals—the activist groups, such as Archizoom and Superstudio—rejected such commercialization and disclaimed any client-oriented approach (Celant, 1972, 380). Demanding structural changes in society, they protested against consumerism, questioned conventional education methods, and self-worshipping architects/designers. They were concerned about the deterioration of environmental issues and the degeneration of society due to capitalist ideology.

The 1972 INDL exhibition was among the first intellectual platforms on the other side of the ocean where the Radicals declared their criticisms to Anglo-Saxon society. Numerous Ph.D. studies and articles have scrutinized the INDL myth and its hallmarks since the late 1990s. As an illustration, Turan (1995, 176), in her Ph.D. thesis *Production of a Discourse*, which resituates Neo-Rationalist discourse concerning the student responses of the 1968 generation politically and socially, argued that via the exhibition, Ambasz's attempt to legitimize Radicals' provocative style as a micro-model for American consumer culture, was the ultimate signal of the critical positions' domestication within the capitalist market. Moreover, Hejduk (2001, 137-8), in *Models of the Mind*, interpreted Ambasz's collection of Italian design as a “coherent whole,” revealing “what types of social, cultural, political, and intellectual ideologies were capturing their imaginations.” Lang (2005) defined INDL as “a blockbuster exhibition..., staging an Italian theme park for a curious American public” in his lecture article on “Superstudio's last stand.” Scott (2007, 118), in her book *Architecture or TechnoUtopia*, “analyzed” the political context of the event and claimed that INDL cast out “specific trajectories within Italian architecture and design” as “critical alternatives to the discursive frameworks and institutional politics of contemporaneous American architectural debates.” Aureli (2008, 81), in his seminal book *The Project of Autonomy*, defined INDL as Ambasz's celebration of “the innovative aesthetic style of radical architecture.” Mutlu Tunca (2009, 2013), in her Ph.D. thesis *Doubling: 'Italy, The New Domestic Landscape' as a Historical Project*, conducted a Tafurian “doubling” of the exhibition by retracing the history and critical theory of American and Italian post-war architecture. She claimed that, rather than objects or environments, the hallmark of the INDL exhibition was its introduction of Manfredo Tafuri's Marxist and critical ideas to American intellectuals through its catalog. Elflin (2009, 179) defined the INDL exhibition as a “blockbuster show” in his thesis *Superstudio and the Staging of the Architecture's Disappearance*, which was an in-depth analysis of “non-tectonic pursuits” of Superstudio's architecture, for providing “the chance to stage their refusal to participate

in the dominant architectural climate in a significant venue in front of a substantial number of viewers." As a result of the exhibition, for Elfline, Superstudio left "the irony-laden magazine works of their immediate past" and started to create "more concrete proposals for how to live a life freed from objects and buildings" (Elfline, 2009, 179). Elfline later published articles on "Radical Bodies" (2015), "Superstudio and the Refusal to Work" (2016), and "Architettura Radicale" (2020), in which he continued to explore how Radical architects expanded the definition of architecture by using alternate mediums and how they criticized the discipline itself for its intimate ties to late-stage capitalism. For Ross (2016, 73), Celant's article on Radical design in the catalog triggered "a spirited debate in the Italian architectural press regarding the term, with most of the prominent actors in the movement disavowing it, the subtext being that once the movement had been identified and named (with MoMA's imprimatur, no less) the radical vitality once there had dissipated." Wolf (2012), in *Superarchitecture*, focused on experimental architectural practices in Italy between 1963 and 1973. Kittler (2014), in "Living Art and the Art of Living," focused on the radical architectural experiments in the INDL exhibition. Rashid (2016), in "Reworking the Past, Displaying the Future," interpreted Gaetano Pesce's environment and criticized the proposals in the 'Environments' category due to the non-humanist dystopic resolutions of the next generation. In *Error Earth*, Halland [Rashidi] (2016; 2018) studied to display "Deep Cybernetics" in *The Universitas Project* and INDL exhibition. In her later article, she analyzed three radical objects and claimed that these objects instigated a new epistemological status of the object, which she coined "unstable." Albon Camon (2020), in "Designing Objectlessness," discussed the problems with object design and its negation in the INDL exhibition, especially the commissions for the Environments section.

Within this wide range of literature, this study revisits the contributions in the Environments section to reveal the signifying traces of the first acknowledgment of the American public from the extraneous intellect behind the Design and Counterdesign dichotomy. The scope is neither to reiterate the radical criticisms nor to recontextualize the significance of their repudiation. The aim is to reappraise the diverse solutions of Italian designers toward environmental problems and unveil the clues of a radical design strategy from an architectural diversity generated by differing political ideas and ideological approaches, criticizing consumer culture, and the deterioration of design disciplines due to mass production.

ITALY: A 'MICROMODEL' OF A NEW STYLE

Ambasz collected one hundred eighty design objects from manufacturers around Italy and displayed them in glass cases, resembling the miniatures of the skyscrapers in New York City (Mutlu Tunca, 2009). In the Objects section of the exhibition catalog, Ambasz classified the displayed objects under three subcategories: Objects with unique forms, techniques, and typologies, objects which inhabit semantic and cultural references, and objects with adaptable and multi-functional natures (**Figure 1**). These subcategories demonstrated how extensive and diverse the repertoire of the Italian design industry was for Ambasz.

On the other hand, the Environments section was where he theorized the confrontation in Italian design on both conceptual and practical levels. Ambasz invited eleven Italian designers and requested them to design "micro-environments" and "micro-events" that provided possible solutions

to current socio-cultural problems in light of his design program's specific and general considerations. Therefore, the contributors designed eleven environmental installations, particularly for this exhibition, by following the research questions asked by Ambasz's design program. In the Environments section of the catalog, Ambasz classified the submitted micro-environments under three subcategories: "Design as postulation," "Design as commentary," and "Counterdesign as postulation." These subcategories revealed how deep the ideological polarization behind the design approaches was for Ambasz. "Design as postulation" category included physical proposals designed by Gae Aulenti, Ettore Sottsass, Jr., Joe Colombo, Alberto Roselli, Marco Zanuso, Richard Sapper, and Mario Bellini that analyzed the ceremonial functions and behavioral factors of home environments. The designer listed alone under the Design as Commentary category, Gaetano Pesce, on the other hand, designed an "archeological environment," an art installation focusing on environmental problems rather than socio-cultural issues. However, the Radical designers of the 'Counterdesign as Postulation' category, such as Ugo la Pietra, Archizoom, Superstudio, Gruppo Strum, and Enzo Mari, approached Ambasz's design problem in rather an anarchistic and rebellious manner. They refused to design any domestic environment and expressed their political resistance and ideological stance against consumerism and corrupted society with art installations or political texts.

Nevertheless, from 1972 until today, the show's myth continued to spread through its exhibition catalog, edited by Ambasz, entitled identically "Italy: The New Domestic Landscape," which was published and distributed simultaneously. The exhibition catalog assembled first-hand information on the proposals of Italian designers. It included historical and critical articles by seminal Italian architectural historians and theoreticians scrutinizing the current achievements and problems of Italian design, which were significant since they revealed the politically provocative context behind Italian design for English-speaking readers. They were for clarifying the discursive and historical context underlying the selected objects and the environments designed for the show (Mutlu Tunca, 2009; 2013). The 1972 exhibition and its catalog contextualized the confrontation of Italian designers under the "Design" and "Counterdesign" dichotomy, which has been the subject of a perpetual debate in the design and architectural world. In 1973, a year later, in a book review on the exhibition catalog published in the journal *Urban Studies*, written by Joyce Lyndon, the exhibition and its catalog were recalled by referring to the prominence of contemporary Italian designers' works in consumer products in Western Europe. Besides the objects and environments of Italian designers, this review focused on the forum the 1972 MoMA exhibition provided for Italian designers, architects, and their critics to discuss and "review their present situation and the troubles, which since 1968 have flared out intermittently" (Lyndon, 1973, 282). Two years after the exhibition, Donald J. Bush, the author of *Streamlining and American Industrial Design* (1974), interpreted the INDL catalog as "a comprehensive review of the current crisis in Italian design." For Bush, the crisis arose from the ethical problem of defining the role of design, exemplifying the controversial responses of designers who, on the one hand, accepted design "as a tool of consumption" and produced saleable products "invested with status meaning," on the other hand, rejected design for propagating political texts (Bush, 1975, 175). As its hallmark, the counter approaches of Radical designers unveil the ideological map of the 1970s Italian design world.



Figure 1. Installation view of the exhibition (May 26, 1972–September 11, 1972. The Museum of Modern Art Exhibition Records, 1004.204. The Museum of Modern Art Archives. Photograph by George Cserna.)

“ITALY: THE NEW DOMESTIC LANDSCAPE,” MoMA AND SPECIAL DESIGN PROGRAM

Ambasz’s analysis of over one hundred and eighty design objects uncovered the absolute complexity of the Italian case. The titles of Ambasz’s categorization, thus, revealed how he interpreted the diverse approaches in Italian design. Further analysis, however, was fulfilled by the Environments section. Ambasz set up a “special design program” for theorizing the provocative figures’ counter solutions regarding the deterioration of the “domestic landscape.” Listing specific and general considerations, Ambasz asked the contributors to analyze domestic life’s

ceremonial and ritual patterns, then propose microenvironments and micro-events for private and/or communal use in fixed and/or adaptable nature.

Under specific considerations, he limited the role of users to binary options. The microenvironments were supposed to function either for a young couple with low or middle income who needed both communal and personal spaces, "a fusion of the Italian stanza and camera" (option 1), or for a couple with children who only required collaborative spaces (option 2). Designed either for the former or latter option, Ambasz required the following ceremonial functions: 1- Living: conversation, relaxation, work, play, reception, and entertaining; 2- Cooking, eating; 3- Sleeping. Ambasz also notified the designers about dimension and material limitations due to shipping and sponsor demands. Due to the shipment regulations by sea, the dimensions of a container limited the maximum dimensions of environments to 4.80 m width x 4.80 m depth x 3.60 m height. They were supposed to be cost-effective industrial prototypes that explored the potential of synthetic materials such as plastics and fibers. Ambasz planned to exhibit the microenvironments in a matte-black exhibition hall. He also asked the contributors to envision the proposal's lighting.

Under general considerations, on the other hand, Ambasz addressed far more universal problems regarding the appreciation of the domestic landscape as a place for "urban society," "as a family environment," or "as a private domain," which for him, resulted in ideological ambiguities worldwide. Identifying the domestic environment as a "theatre" where external "forms and scripts" re-enacted and modified the private domain of domesticity into a social one, Ambasz valued the expansion of home culture for its capability to rebuild new stereotypes of urban patterns (Ambasz, 1972, 139-43).

Considering the formal and ideological claims of radical figures in Italy, Ambasz invited several designers and design groups to develop unique solutions for "new" domestic landscapes, as identified by his "special design program" (Ambasz, 1972, 12). He also attached his 1969 article on "Manhattan: Capital of the Twentieth Century," first printed in *Casabella*, XXXV, no. 359-60, 1971, to encourage the designers, in his words, "to make incursions into [an] imaginary realm." In this article, Ambasz analyzed Manhattan's infrastructure with "all the complexity of its physical organization, the capacity of its input-output mechanisms, and the versatility of its control devices" (Ambasz, 1972, 147). Rather than being a technologically revolutionized urban artifact best representing American culture, Manhattan, for Ambasz, had an autonomous infrastructure for a metropolis; even if liberated from its context and placed somewhere else, it remained insufficient without its superstructures. Therefore, he thought that the designers need to concentrate on "man" and uncover "the perennial state of the transaction between the fears and desires underlying the individual's aspirations and the assembled forces of his natural and his socio-cultural milieu" (Ambasz, 1972,148).

For providing a frame of reference, Ambasz also recommended a reading list, including books on *Environmental Psychology: Man and his Physical Setting* (1970) by Proshansky et al., *The Nonhuman Environment in Normal Development and Schizophrenia* (1960) by Harold F. Searles, which defined "the present 'state of the art,' as an indication of how much (or how little) is known about the relation of the nonhuman environment to human behavior" (Ambasz, 1972, 146). Other suggested readings were

for generating “a poetical insight into the meanings and images of the domestic environment”: ‘Thanksgiving for a Habitat’ in *About the House* (1959) by W. H. Auden; ‘Existential Space’ in *Landscape* (1966) by George Matoré (ed.); and ‘The Time House’ in *Architectural Design* (1968) by Martin Pawley.

The arrival of microenvironments proved to Ambasz that Italian design’s “contradictory” approaches concealed a more chaotic debate than he anticipated. Therefore, he preferred to simplify the contradictions as per the tendencies of contributors “to design” or “not to design.” The titles of his classification, “Design as postulation,” “Design as commentary,” and “Counterdesign as postulation,” indeed unveiled inverse positions of Italian designers, approaching product design not just as an aesthetic domain but as an ideological concern.

Design “Environments” as Postulation or as Commentary

The categories of “design as postulation” and “design as commentary” gathered physical microenvironments. As the tone of the proposals revealed the neo-science-fiction atmosphere of the time, one can certainly state that the primary motivation was Italian radicals’ disobedience to the demands of the culture industry with an ideological projection of the future. They mainly criticized the transformation of consumers’ so-called reified consciousness and controlled will, digressed by the culture industry, as Adorno & Bernstein (1991, 185) claimed, into the automatic self-reproduction of the status quo by consumption. As a challenge against such expressions of domination, the Italian designers in this category rejected Modernist sanctions and stereotypical productions of the day and “postulated” or commented about microenvironments, either “house” or “mobile,” to deliver solutions for the socio-cultural problems of the day.

A Milanese designer and architect, Gae Aulenti’s (1927-2012) red pyramids were the most appealing yet paradoxically modest “house environment.” As *Casabella’s* former art director and graphic designer (1955-1965) and as a disciple of the prolific writer Ernesto Nathan Rogers (1909-1969), Aulenti completely absorbed Rogers’ architectural tutelage, who was highly critical of Modernism and its devolution. She reduced her domestic environment to synthesize four spatial elements with attributed meanings to eliminate current ambiguities and contradictions in Italian design. Aiming to measure “the process of transformation,” she used the pyramid form because of its connotation reminding the concept of “place,” thus ruler and triangle forms as allusions, gauging “the matrix of everyday mutability” (Figure 2). For encouraging experiences, Aulenti used “fire” as the “allegory,” regarding “a synthetic and comprehensive representation of an idea through images.” Aulenti’s random arrangement of these spatial elements facilitated the domestic environment’s adaptability for diversified everyday life experiences (Aulenti, 1972, 152-3).

The “ugly” wheeled, adjustable boxes of Italian designer and architect Ettore Sottsass, Jr. (1917, Austria-2007, Italy), on the contrary, criticized the unconscious consumption of “good design” and the obsolete codes of collective memory on aesthetics. It was classified as a “house environment” by Ambasz, the mobility of Sottsass’ boxes, functioning as a stove, refrigerator, cupboard, or more, facilitating the configuration of alternative living spaces by multiplying the quantity of ugly boxes in various specific qualities consistent with the changing needs. (Figure 3) As the user’s collection of selected units could vary to provide the most suitable setting

for the drama in progress, Sottsass' boxes neither attempted to create customer attachment, interest, or involvement with the design nor any demand for its aesthetics. "[T]hrough its neutrality and mobility, through being amorphous and chameleon-like, through its ability to clothe any emotion without becoming involved in it," Sottsass' microenvironment disregarded the principles of "heroic design" on purpose. It focused on creating the most convenient setting for any ceremony, which led to "provoke a great awareness of ... creativity and freedom." (Sottsass, 1972, 162-3).

"Total Furnishing Unit" of Joe Colombo (1930-1971), a Milanese industrial designer, on the other hand, composed of white and yellow plastic blocks with smooth rounded corners in 1970's high-tech appearance, proclaimed a surrealist utopia. (Rossi, 2014, 50-9; Banham, 1997, 995). Critically concerned about the complex society, the uncontrolled expansion of cities, and the damage to nature, Colombo intended to correlate "man with his dwelling" by focusing on the variability of user needs in the domestic environment at different time sequences of the day. He proposed an adjustable system with "a series of suitably equipped 'furnishing units,' freely placed within their allocated areas" (**Figure 4**). Offering kitchen, cupboard, bed & privacy, and bathroom functions, Colombo sets the users of his environment free to organize the living environment according to their immediate needs. Colombo's possible allocations of the units, such as attaching a bed and privacy unit with storage, detaching them from the kitchen and bathroom units, or using the bed and privacy unit as a separator between day and night functions, proved the adaptable nature of his domestic environment (Colombo, 1972, 172) (2).

While the house environments of Aulenti, Sottsass, and Colombo offered the ultimate freedom in the organization of interior space, the mobile environments proposed by another group shifted the level of independence from house to urban by liberating the domestic environment from its strict bond with landscape. As an illustration, Alberto Rosselli (1921-1976), an Italian architect and pioneer of industrial design, based his proposal on transporting and expanding space. "Movement" and "repose," Roselli's key concepts, facilitated his' house object to get a compact yet expandable form fulfilling the transportation requirements on the road while satisfying optimal living conditions. Carried by a small vehicle, Roselli designed a "Mobile House," made of a lightweight aluminum capsule. Expandable fourfold upon opening through telescopic runners, hinged floors, and accordion walls, his capsule offered a "Central Area" to be used as a general or dining area with service and closet functions, a "Rear Area" to be used as a private space during nights with two folding beds and closets, and a "Front Area" to be used as a living area during the day and a bedroom with two or three beds at nights (**Figure 5**). Suitable for individual and group living, gathering a series of capsules allowed the fulfillment of a more comprehensive range of uses (Rosselli, 1972, 182-3).

Studio Zanuso, founded by Milanese architect Marco Zanuso (1916-2001) and his partner, German designer Richard Sapper (1932-2015), on the other hand, thematized their mobile environment as "complete and fully equipped habitations, easily transportable and ready for immediate use." Rather than aiming for "mobility at the family level," Studio Zanuso chased after "mobility at the urban level" by supporting "the immediate transport of communities and living quarters to any part of the world by conventional means of transport." In this context, they decided to

2. As Joe Colombo died suddenly a year before the exhibition's opening, Ignazia Favata, who later in 1988 wrote a book on *Joe Colombo and Italian Design of the Sixties*, completed his design (Brown, 2016, 96).

function industrial containers for transatlantic freight into mobile houses for at least two persons. (**Figure 5**) Once transported to a site, Zanuso's container expanded by sliding out two large plastic alcoves stored inside: one containing the bed, the other for the kitchen. Considered "a component element of a housing scheme," its vertical or horizontal augmentation enabled the accommodation of more persons and allowed the assembly of temporary living quarters for communities. Conceived for the immediate use of any user group, Zanuso's site-free and portable containers offered the necessary temporality of land use with maximum respect to the natural surroundings (Zanuso, Sapper, 1972, 192-3).

Milanese architect and designer Mario Bellini (1935, Milan), who was the vice-president of the *Association for Industrial Design* (ADI) and the chief industrial design consultant of the Olivetti company, debated further on "the meaning of moving." Bellini (1972, 202-3) reinterpreted the classic "auto-mobile" and designed Kar-a-Sutra as a "human space in motion," or in Bellini's terms, as "a new territory, visiting around and having people involved with this adventure." With its large windows and flexible interior, the large green vehicle undertook to liberate its users from any automobile-conditioned behavior by facilitating the routine ceremonies of daily life inside a car, such as face-to-face conversation, eating and entertaining, sleeping, and so on. With a load capacity of twelve people without baggage, Kar-a-Sutra offered ultimate freedom to its users through its flexible plastic cushions. Enabling any rearrangement in case of demand, Kar-a-sutra was an expostulation against the ordinary design manner in the automobile industry that lacked incorporation of human will. Bellini's design criticized "the parameters of the automobile-man system," dominated by the automotive industry and its rapid consumption, symbolizing the status quo (Bellini, 1972, 202; Neira, 2017) (**Figure 6**).

All were unique expressions of Italian Radicals who postulated design as a means of a revolt against the domination of the cultural industry, imposing the mutual interaction of mass production and consumption. Architect and industrial designer Gaetano Pesce's proposal, or in his words, "habitat" in the Design as Commentary section, exhibited in Centre Pompidou today, however, sought the possible way to say "no" to the design problem. The Counterdesign as Postulation section was a distinctive category that introduced a provocative counter stance towards design to the American audience.

Counterdesign "Environments" as Postulation

If the design is the only motivation to consume, then we must reject the design; if architecture is the only way to legitimize the bourgeois model of ownership and society, we must reject the architecture Until then, design may disappear. We can live without architecture.

Adolfo Natalini, Lecture Notes, Architectural Association School of Architecture, London, March 1971(Natalini in Adjustments Agency, 2018)

The "Counter Design as Postulation" category gathered designers' proposals who demanded radical structural changes in society. These radicals chose "not to design" a domestic environment. Instead, they preferred to voice criticism towards the deterioration of society, consumerism, uncontrolled information, and communication media, towards the official culture, repressing the patterns of religious, aesthetic, cultural, and even environmental behavior, thus towards the orthodoxy of the architectural and design world. The activism of designers, represented



Figure 2. Gae Aulenti's Domestic Environment, installation view

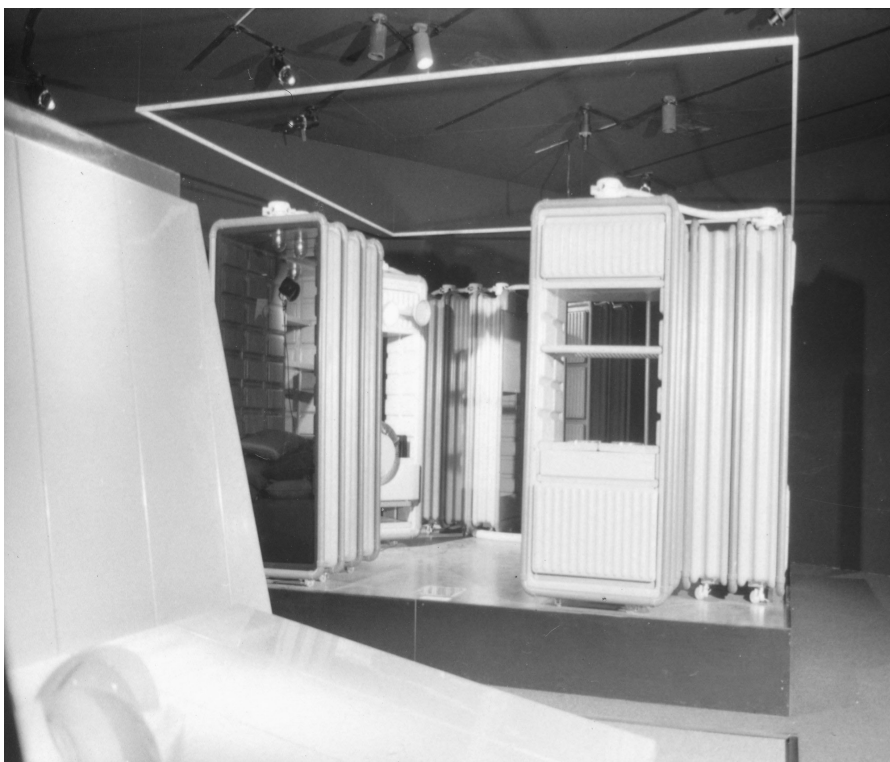


Figure 3. Ettore Sottsass' Domestic Environment, installation view (The Museum of Modern Art Exhibition Records, 1004.108. The Museum of Modern Art Archives. Photograph by Leonardo LeGrand.)

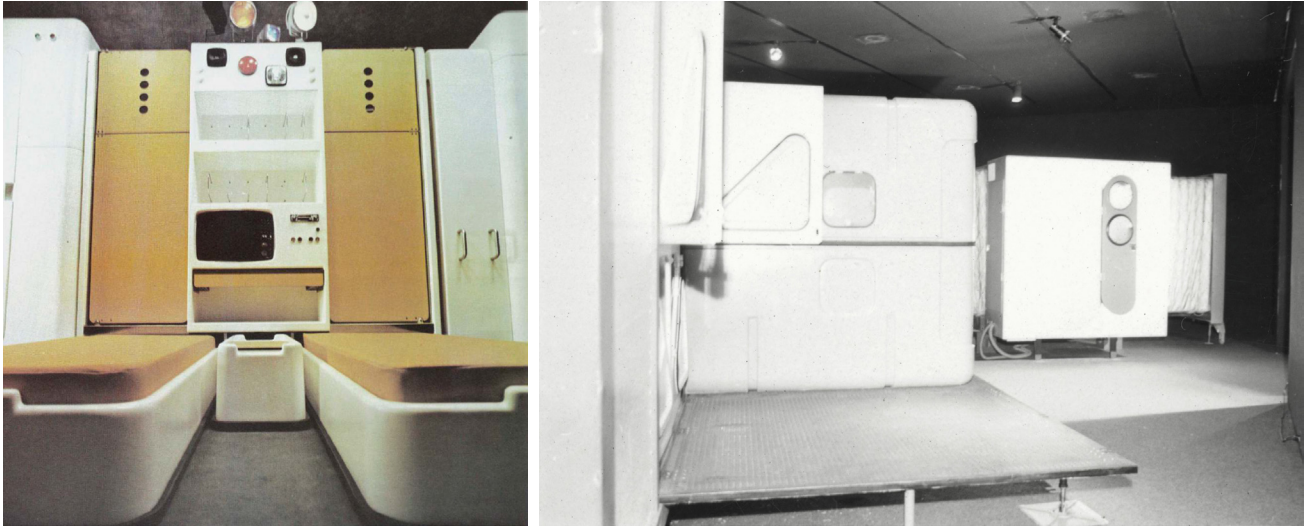


Figure 4. Joe Colombo's Domestic Environment from the exhibition catalog (Colombo,1972, p.175)

Figure 5. Alberto Rosselli's Mobile House on the right, Marc Zanuso and Richard Sapper's Domestic Environment on the left, installation view (The Museum of Modern Art Exhibition Records, 1004.204. The Museum of Modern Art Archives. Photograph by Leonardo LeGrand.)

by the installation or action art, stood unique and radical, dissenting to be labeled within the codified boundaries of the architectural and design world, or better called, to be signified as a compulsion of, in his terms, the system, promoting ultimate consumerism.

As an instance, Ugo La Pietra (1938- Bussi Sul Tirino), who defined himself first as an artist, then an architect and designer, transformed "the domicile cell" into "a microstructure within the information and communication systems" and submitted a series of comprehension models, respectively called *Immersion*, *The New Perspective*, *Microenvironment*, *Audio*, and *Audio-visual microevents*. La Pietra's 1967 *Disequilibrating System*, a theoretical "refusal to work within the system" or a "subjugated" art or architecture profession, was the basis of the first two aesthetic operations: *Immersion* and *The New Perspective*. They were to provoke the users into alienation from distorted reality in private refuge towards a "new perspective." In *Comprehension model A: 'Immersion'*, for instance, the visitor got into a cylindrical instrument, a separation displacing codified forms of



Figure 6. Mario Bellini's Kar-a Sutra, installation view (Photographic Archive. The Museum of Modern Art Archives, New York. Photograph by Leonardo LeGrand)

privacy, disconnected from reality and experiencing a crisis between the ultimate desire to be isolated from the context and the aspiration for “an unbalancing inclusion in the system.” In *Comprehension model B: ‘The New perspective,’* La Pietra pointed out the necessity “to repropose the problem of direct awareness of reality (overcoming the ‘barrier’ of the ‘instrument’ that acts as a mediating filter between us and reality).” Creating a kind of camera obscura without the mirror tilted at a 45° angle and the lens, he eliminated the filter and the manipulator to enable the visitor to see reality directly. The other models were editions of La Pietra’s fantasy for the domestic environment: a private space equipped with information and communication media tools yet keeping them “under control.” La Pietra’s proposal criticized the meaning of attempting to rediscover the domicile cell in its most innovative form. Instead, Pietra designed a “living” cell to endorse the “barrier” created between the people and reality posed by the use and dominance of telematic devices over the urban privacy system and society. Later named a “Telematic House” (*Casa telematica*, 1971), he equipped the cell with Ciceronelettronico and Videocomunicatore — sound and video transmitter— connecting private space and urban fabric (ugolapietra.com). Expressing his regret for the incoherence of his scope during the INDL exhibition, La Pietra reinterpreted the “domicile cell,” symbolized by the elementary form of a triangle, as a station for real-time processing and redistribution of public information in private space and vice versa (Pietra, 1972, 226-7) (**Figure 7**). All criticized illusionism, created by information and communication systems.

On the other hand, the Florentine design group of Andrea Branzi, Gilberto Corretti, Paolo Deganello, and Massimo Morozzi, named *Archizoom Associati* (1966), created an environment that displays the power of “programmed electronic media” causing the efficacy of older paradigms’ loss. Concerned with product design, architecture, and interior design, Archizoom best presented its polemical activities in its 1966 *Superarchitettura I* and 1967 *Superarchitettura II* exhibitions. Embracing consumerist culture as a radical criticism of capitalism, Archizoom, primarily due to the cultural impact of Manfredo Tafuri’s 1969 essay “Toward the critique of architecture ideology,” approached design as a critique of the mass production/consumption of objects. Moreover, they considered the design process a symbolic and political phenomenon that must be changed drastically (Hershon et al., 2020, 206; Molinari, *Radical Pedagogies*).

For the INDL show, *Archizoom Associati*, as described by Scott, proposed an installation that imitates “the logic of capitalism as to short-circuit somehow its operations” (Scott, 2007, 142). Identifying “violent conflicts, uncontrolled disorder, and spontaneous growth of means of communication” as “short tactics” adopted by the city to impel citizens “to integrate within consumer society,” Archizoom created a “precisely calculated assimilation” with audio and audio-visual tactics. Refusing to build an environmental model to live in, as described by Ambasz’s design program, Archizoom proposed a “hollow space,” in their terms, an empty white cube purged of any image to avoid picturing a domestic environment. However, via a sound system, this “hollow space” conditioned people with “words,” allowing them to adopt different “meaning” and “values” to the very concept and to imagine as many versions of it as they could because of the narrated stories by audio devices (**Figure 8**). Archizoom proposed “[n]ot a single utopia, then but an infinity of utopias, as many as there are listeners. Not just a single culture



Figure 7. Ugo la Pietra's microenvironment, installation view (The Museum of Modern Art Archives, New York. Photograph by Leonardo LeGrand)

but one for each individual". For Archizoom, the problem was beyond seeking freedom for man in a reality that lacks meaning (as a system that is "meaningless" in itself produced that reality). Nevertheless, the problem was seeking liberty, for the free will in possessing man's capability to obtain his own "right to act, modify, form and destroy the surrounding environment" (Archizoom, 1972, 234). By describing the rituals Ambasz identified with words, Archizoom emphasized the power of "word" and criticized the dominating control of audio communication on the user politically. According to Archizoom, "Violent conflicts, uncontrolled disorder, and the spontaneous growth of means of communication are the shock tactics that the city adopts to compel the citizen to integrate himself within consumer society" (Archizoom, 1972, 237).

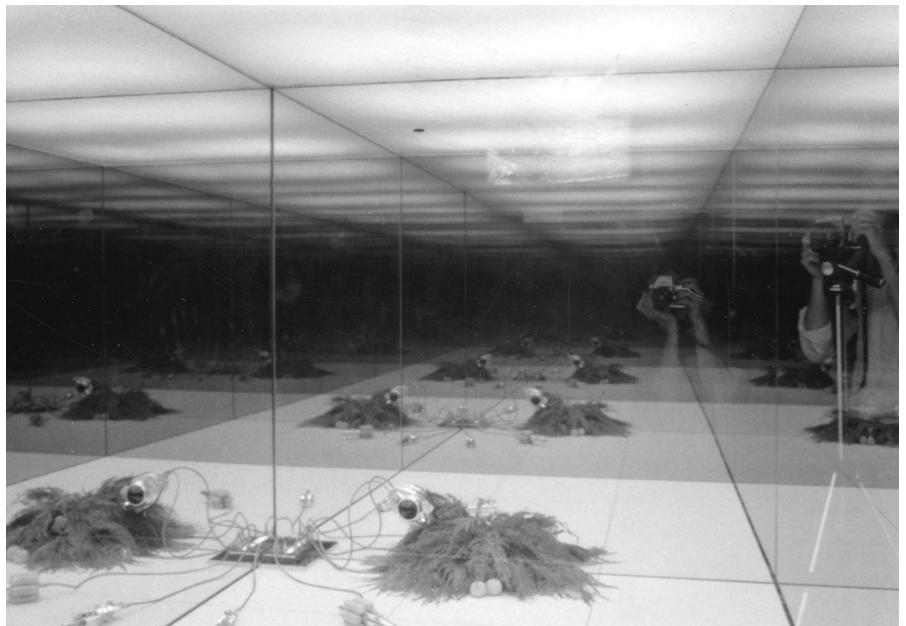
Another Italian Radical Architecture collective, Superstudio, approached Ambasz's problem in an analogous yet propagandist manner. Identifying themselves as a "situationist movement" rather than a group, Superstudio (active between 1966-1986), consisting of Piero Frassinelli, Alessandro Magris, Roberto Magris, Adolfo Natalini, Alessandro Poli, and Cristiano

Figure 8. Archizoom's environment, installation view (The Museum of Modern Art Exhibition Records, 1004.108. The Museum of Modern Art Archives. Photograph by Leonardo LeGrand.)



Toraldo di Francia, “used architecture’s traditional instruments (drawing and projects) to criticize not only architecture and its trends but also society” (Natalini in Byvanck, 2005, 25). As “real avant-gardes,” the group, for Natalini, “tried to destroy the existing system, free divisions, cultural colonialism, violence, and consumerism” for “the utopia of a free world and a life free from work, a life without objects” (Natalini in Byvanck, 2005, 25). They refused to design a domestic micro-environment and presented “an alternative model for life on earth” (Superstudio, 1972, 242). In a black room, contoured by thin luminescent lines, Superstudio displayed the model of a square plate. Placed in a rotating turret built of polarized mirrors in the center, this plate “produc[ed] the illusion of infinite space inside a small cube with a ‘supersurface’ in a plastic grid, populated by technological devices as life supports and abstract-vegetal creatures” (Quesada, 2011, 23). (Figure 9)

Figure 9. Superstudio's environment, installation view (The Museum of Modern Art Exhibition Records, 1004.108. The Museum of Modern Art Archives. Photograph by Leonardo LeGrand.)



With the help of a little machine connected to a T.V. screen, they projected a three-minute documentary on the model in various natural/work situations and meteorological events such as sunrise, storm, clouds, and night on the ceiling. This installation symbolized Superstudio's utopia of a "life without work and a new 'potentialized' humanity, ... made possible by a network" (Superstudio, 1972, 242). Superstudio's pop collages and the Cartesian squared Supersurface, "visual-verbal metaphor[s] for an ordered and rational distribution of resources," represented a grid with nodes that would provide instant shelter, food, and communication tools for nomadic inhabitants (Elfline, 2016, 67). Superstudio rendered, for Quesada, an everyday life in the interstices of "supersurface" that lacked to "propose a definitive setting for the future, but an exercise in momentary liberation, an ephemeral act of freedom" (Quesada, 2011, 23). Superstudio's "elimination of all formal structures, [their] transfer of all designing activity to the conceptual sphere [grid], ... [their] rejection of production and consumption, rejection of work" were to liberate inhabitants from the subjugation of city and of consumer culture (Superstudio, 1972, 244).

Another Italian radical design group participating in the Environments section was Gruppo Strum, the Group for Instrumental Architecture (Turin, 1966-1975), founded by Giorgio Ceretti, Pietro Derossi, Carlo Giammarco, Riccardo Rosso, and Maurizio Vogliazzo. Opposed to the functionalism of the International Style, the group pioneered the development of the antidesign and radical architecture movements with their theoretical work (Cooper Hewitt Collection, n.d.). For the INDL show, they neither designed a physical environment as reformists nor proposed an art installation, as Archizoom and Superstudio did. They approached the problem rather literarily and preferred to criticize the problems in society on an intellectual level. Setting up a stand in the exhibition, Gruppo Strum distributed "photostories," pamphlets in white, green, and red color, addressing significant aspects of design the collective underscored. The white-colored booklet, for instance, focused on "the struggle for housing." It contended discussions on how these struggles "reshape[d] cities by attacking and defeating the capitalist organization of the territory together with the symbolic values that formalize it" (Gruppo Strum, 1972, 254). "UTOPIA," the green photostory, rendered Gruppo Strum's dream of a technological world for happy people. For Strum, utopia "as a means of intervention, directly linked with the organization of struggles against the programmed reorganization of capital" was "an act of provocation, and ... a negation of the objectivity of the present-day system of production" (Gruppo Strum, 1972, 255). The red pamphlet, "The mediatory city," contented "five realistic examples of precarious living conditions and struggles on the boundaries of ruling class legitimacy. The common matrix [was] the rejection of the established order as a limit to creativity" (*ITALY/ GRUPPO STRUM*, 1972, MoMA Archives, NY). The photostory analyzed "the patterns of behavior, imposed by the bourgeois city, and provoked new patterns of resistance against the impositions of a capitalist system" (Mutlu Tunca, 2009, 149) (**Figure 10**).

The last refusal to design came from Enzo Mari (1932). Inspired highly by communism and the idealism of the Arts and Crafts movement, Milanese artist and furniture designer Mari founded the Nuova Tendenza art movement in the 1970s (Museum of Modern Art Collection, n.d.). For the show, he solely submitted a text clarifying his philosophy of the environment in which he compared the diversity of communications in the Objects and Environments sections. For Ambasz, Mari's article

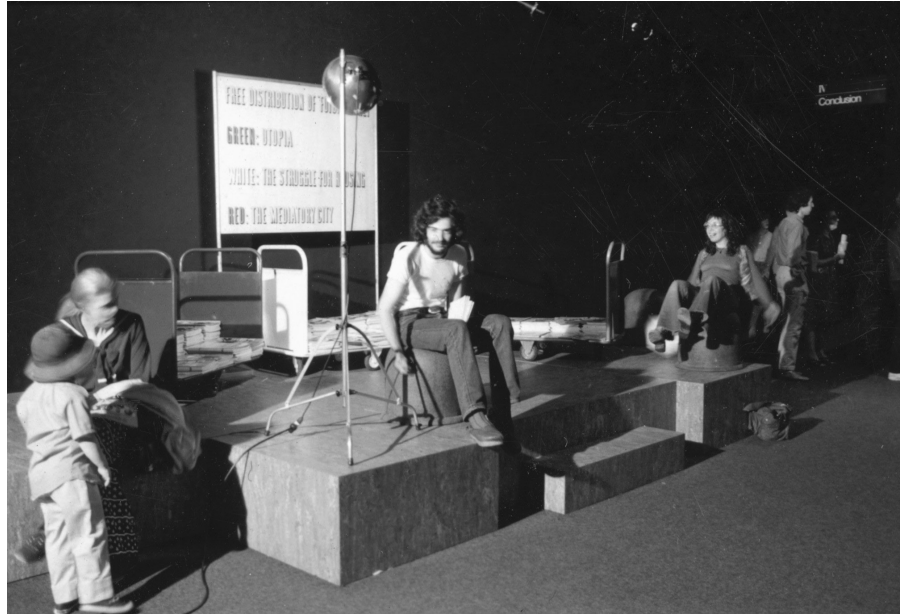


Figure 10. Gruppo Strum's stand
(Photographic Archive, The Museum of
Modern Art Archives, New York. IN1004.58.
Photograph by Leonardo LeGrand.)

revealed that “the only valid sphere of action for the designer is that of communications, and that the only honorable strategy open to him is that of renewing language—the alphabet included” (Ambasz, 1972, 262).

As for Mari, communication was the primary determinant of “social relations and their evolution,” the protest of artists against class struggle, consumer culture, against ideological and political compulsions required a “language research” with “true” Marxian ideals for regenerating communicative and linguistic tools. For Mari, the liberation of “research dialectics from all mystifying superstructures” necessitated imposing a code of behavior— for artists who credited class struggle as the only way to resolve social evolution, who considered artistic activity solely as an instrument of collective action. This code of behavior facilitated the revision of false justifications, regarding Marxian values, even in dialogue with the ones maintaining antagonist standpoints. Rather than abstract assertions, detached from the daily practices in the profession, the artists of the day, for Mari, were responsible for designing critical works with realistic motivations, clarifying their free ideological choices. Therefore, the communication of their own artistic or critical activity incorporated the “[e]nunciation of his own utopian vision of the development of society,” a strategy with tactics to achieve this ideal and the synchronization of research with those tactics (Mari, 1972, 264-5). Admitting that any attempt to reject subjugation might enfold manipulation and the ignorance of others, Mari singled out such ignorance due to “their avowed adherence to the dominating class, as their feigned adherence to the class that is dominated” (Mari, 1972, 265).

Regarded by Marcos Parga, assistant professor at Syracuse University, as the crime scene of Radical architecture, the INDL exhibition provided the initial international recognition of the movement (Parga, 2015, 14-5). The counterdesigns of Radical Italian designers, thus, exclaimed a crisis of project to resist the compulsions of modernity. They, in a way, showed consumer society that design had facilities other than producing consumer goods. Rejecting to design a house environment, they deconstructed conventional recognition of design to reveal its power to resist ideological

compulsions. For awareness of social and political problems, antidesign manifestos, approaches, and proposals attempted to reconstruct design as a tool to criticize consumerism, mass media, the uncontrolled disorder in cities, and capitalism. Moreover, they condemned “high art” and “industrially produced consumer art,” mesmerized under the “stigmata of capitalism,” as proclaimed by Adorno in his famous book on *Culture Industry*.

Nevertheless, as a prominent architectural theoretician and historian with a Marxist mindset, Manfredo Tafuri, in his article “Design and Technological Utopia” — one of the critical articles added by Ambasz at the very end of the catalog — regarded such analytical studies on the theory of communication as naive proclamations that undermined “the indissoluble links between technological aesthetics, the theory of symbols, and the capitalist theory of development,” therefore devoided to become “an ideology of compensation.” He criticized such unjustified suggestions, analyzing the “relations between communications and consumption, and between the theory of technological and linguistic innovation.” For Tafuri, since design was “an extensive information system directly involved with advertising,” the designers exploited its potential to compensate for “distortions in consumption” by recovering its “social, humanitarian and revolutionary role.” Tafuri claimed that “semantic restructuring,” influenced by ongoing semiological and structuralist discourses of the 1970s, was a “convenient alibi” for designers within such scope; yet the endeavors “to ‘resemanticize’ the object” for recovering its “myths” dragged the discipline into a surreal, ambiguous, and “gratuitous” sphere. The historical paradox witnessed in Italy was due to the challenge of these gratuitous endeavors, exemplified by the ironic works of Aulenti and Sotsaass, which Tafuri defined as esoteric and anguished, to “the ideological ‘frenzy’ of radical design” (Tafuri, 1972, 393-4). Tafuri, however, considered both as theatrical acts that criticized the former functionalist utopias but created “new utopias” “in which ‘plays of anticipation’ are performed with conscious detachment” (Tafuri, 1972, 394). For him, both sought to “redress the ethical ‘distortions’ of the technological world by modifying the system of production or the channels of distribution.” Nevertheless, these “intellectual anti-consumer utopias,” Tafuri coined, either by design or not, underestimated the unbreakable link between production, distribution, and consumption in a capitalist system.

CONCLUSION

Consumer culture and consumer society were among deliberate discussion topics in the architectural debates of the 1970s, as it is today. Studies have shown that 1972 and Ambasz’s “Italy: The New Domestic Landscape” exhibition marked a critical threshold for American architecture and design society. About two years after the exhibition, Diane Agrest, one of the most promising academics at Princeton University, invited Manfredo Tafuri to lecture at the “Practice, Theory and Politics in Architecture” conference. For the first time in the United States, Tafuri presented a speech on the latest tendencies in American architecture and discussed “a typology for different approaches to criticism” (Hays, 1998, 291). Just after the seminar, the editors of *Oppositions*, the renowned journal of IAUS, published the text of Tafuri’s lecture under the title “L’Architecture dans le Boudoir” (*Oppositions* 3, 1974), which highly surpassed the impact of his first English article, “Design and Technological Utopia” (1972). From its selection

as either the first or the last article by reputable architectural theory anthologies, one can understand the influence of “L’Architecture dans le Boudoir” on the transition of American architectural discourse toward a more critical state. Two years later, Agrest (1976, 49), in her article “Design versus Non-Design,” published in *Oppositions* 6, where her interest in Tafuri’s theories and the design / counter-design debates became apparent, proposes “non-design” as the counteract of “design.” While design, for Agrest, is characterized as an institutional and settled social practice with a set of sanctioned rules and norms specified by normative writings and written texts of architecture, non-design retains no defined limits and specificity, therefore, allows “the inscription of sense in a free and highly undetermined way.” In her text, theorizing non-design as the articulation of “a complex social text, a semiotically heterogeneous object,” signified by different cultural systems at the level of codes, Agrest referred to Manfredo Tafuri’s article in Italian on Giovanni Battista Piranesi and his architecture as a “negative utopia” (Giovanni Battista Piranesi; L’Architettura come “Utopia negativa”), as if confirming that Ambasz’s show triggered a series of interactions instigating a linguistic turn towards criticism in the architectural debates.

Besides instigating a linguistic turn, designs and counterdesigns of Italian radicals, displayed in Ambasz’s INDL show, or as Halland (2016, 2640) claimed, the “utopias and dystopias” they proclaimed, set an ideal for the “making” or “unmaking” of “... our ultimate environment, the planet earth.” In other words, the “utopias,” listed under the Design as Postulation category, refuted the paradigms of Modernism and the sway of consumerism, attempted to demolish the judgment of “good design” in consumers’ minds, and reconsidered socio-cultural and ideological sanctions before designing domestic environments. The “dystopias,” listed under the Counterdesign as Postulation category, contrarily reinforced the supremacy of design’s representative power, dissociated the design act from industrial management, and attempted to revolutionize the planning phase. The radical attempts of counterdesign advocates engendered the disclosure of political and ideological criticisms against capitalism and mass media. Through artistic creation, they criticized the malaise in cities and expressed their pessimism towards the redundancy of professing architecture unless structural changes in societal terms occurred. Both endeavors encompassed unique criticisms of Marxist and Leftist designers against environmental and sociopolitical problems aggravated by consumer culture. The differences in their liberal criticality about restructuring society and spatiality uncovered the most novel opposition of that time, denouncing capitalism, mass production, and consumption as the causality of the design discipline’s deterioration.

The institutional crisis of architectural and design practice in Italy that day, which even provoked Italian radicals to the point of not designing, simulates the “catastrophic” condition of architecture and design today. Increases in the symptoms of the culture industry produced different consumption patterns that demanded the social reorganization of the masses and their spaces, transforming the stability and permanency of the paradigmatic domesticity to instability and impermanence. Hence, while this study has focused on the diversity of architectural solutions in the INDL exhibition, be it design, counterdesign, or any deed within the boundaries of architectural practice itself, what remained unchanged is the shared theoretical concerns underlying all postulations with environmental, societal, ideological and therefore architectural dilemmas

we face today. Current challenges in all those spheres modify a particular content of our disciplinary perplexity and disorder; thus, concerns on the climate emergency, Anthropocene, migration, pandemics, quarantine period, as well as natural disasters we have lived through, such as the 2021 Aegean forest fires and 2023 Turkey- Syria earthquake, aggravate the symptoms of malaise, scrutinized by Ambasz once as if testifying their enduring significance over and above the disciplinary objectives at hand. Therefore, this paper reiterates Italian radicals' critical conception of domestic space and consumption as the means of re-evaluating, re-elaborating, and re-elucidating the people's association with their environment today over an ideal once foreseen by the participants of the INDL exhibition.

BIBLIOGRAPHY

- ADORNO, T.W., & BERNSTEIN, J.M. (2001) *The Culture Industry: Selected Essays on Mass Culture*, Routledge, London.
- ADJUSTMENT AGENCY (2018) Refusal after Refusal, *Harvard Design Magazine* (46: F/W). [<https://www.harvarddesignmagazine.org/issues/46/refusal-after-refusal>] Access Date (09.06.2023).
- AMBASZ, E., ed. (1972) *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, Museum of Modern Art, New York, Centro Di, Florence.
- ARCHIZOOM (1972) [Project definition of Archizoom's installation], *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 234-9.
- AULENTI, G. (1972) Project definition of House Environment, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 152-9.
- AURELI, P.V. (2008) *The Project of Autonomy: Politics and Architecture Within and Against Capitalism*, Temple Hoyne Buell Center for the Study of American Architecture, New York.
- AURELI, P.V. (2008) Toward the Archipelago, *Log* (11: Winter) 91-120.
- AURELI, P.V. (2009) More and More About Less and Less: Notes Toward a History of Nonfigurative Architecture, *Log* (16) 7-18.
- BANHAM, J. (1997) *Encyclopedia of Interior Design*, Routledge, London.
- BELLINI, M. (1972) Kar-a-Sutra, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, eds. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 202-10.
- BOTTINELLI, S. (2015) The Discourse of Modern Nomadism: The Tent in Italian Art and Architecture of the 1960s and 1970s. *Art Journal* (74:2) 62-80.
- BUSH, D.J. (1975). *The Streamlined Decade*, G. Braziller, New York.
- BUSH, D.J. (1975, Spring) Reviewed Work: Italy: The New Domestic Landscape: Achievements and Problems of Italian Design ed. by Emilio Ambasz, *Leonardo* (8:2) 174-5.
- BYVANCK, V. (2005) *Superstudio: The Middelburg Lectures*, De Vleeshal and Zeeuws Museum, Middelburg, Netherlands; 43-52.

- CAPDEVILA, P.M. (2017) An Italian Quarelle: Radical vs. Tendenza, *Log* (40) 67-81.
- CELANT, G. (1972) Radical Architecture, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 380–7.
- COLLARD, P. (2012) Italy: The New Domestic Landscape, *Disegno* (2) 76-94.
- COLOMBO, J. (1972) Total Furnishing Unit, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 172–9.
- ELFLINE, R.K. (2009) *Superstudio and the Staging of Architecture's Disappearance*, unpublished Ph.D. Dissertation, University of California, Los Angeles.
- ELFLINE, R.K. (2015) Radical Bodies, *Hippie Modernism: The Struggle for Utopia*, ed. A. Blauvelt, Walker Art Center, Minneapolis.
- ELFLINE, R.K. (2016) Superstudio and "The Refusal to Work," *Design and Culture* (8:1) 55–77.
- ELFLINE, R.K. (2020) Architettura Radicale, *Menelique: Design* (4) 100–6.
- GRUPPO STRUM. (1972) For a Mediatory City, *Italy: the New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 254–61.
- HALLAND RASHIDI, I. (2016) (Re)working the Past, (Dis)playing the Future. *Italy: The New Domestic Landscape at MoMA, 1972, Future-Focused Thinking - DRS International Conference 2016, 27 - 30 June*, eds. P. Lloyd & E. Bohemia, Design Research Society, Brighton, United Kingdom; 2640–53.
- HALLAND, I. (2018) *Error Earth: Displaying Deep Cybernetics in "The Universitas Project" and Italy: The New Domestic Landscape, 1972*, unpublished Ph.D. Dissertation, University of Oslo, Oslo.
- HALLAND, I. (2020) The Unstable Object: Glifo, Blow and Sacco at MoMA, 1972, *Journal of Design History* 33(4) 329–45.
- HAYS, K.M., ed. (1998) *Oppositions Reader*, Princeton Architectural Press, New York.
- HEJDUK, R.P. (2001) *Models of the Mind: A Theoretical Framework for the Continental Radical Avant-garde in Architecture around 1968*, unpublished Ph.D. Dissertation, Harvard University, Boston.
- HERSHON, M.S., HORNE, S., KUBALA, T., STRAUSS, C. (2020) Biographies, *Radical: Italian Design 1965-1985: the Dennis Freedman Collection*, ed. C. Strauss, Yale University Press, New Haven; 206–11.
- HORKHEIMER, M., & ADORNO, T.W. (2002) *Dialectic of Enlightenment: Philosophical Fragments*, Stanford University Press, Redwood City, California.
- ITALY/GRUPPO STRUM. (1972). *MoMA Press Release Archives*. [https://www.moma.org/momaorg/shared/pdfs/docs/press_archives/4823/releases/MOMA_1972_0052_45X.pdf] Access date (05.04.2022)
- KOVESHNIKOVA, E.N., KOVESHNIKOVA, N.A., PRAVDYUK, V.N. (2016) From Functionalism to Postmodernism: Transformation of the

Paradigm of Design Culture, *Turkish Online Journal of Design, Art, and Communication* (Special Edition) 3284-90.

- LANG, P. (2005) Superstudio's Last Stand. 1972-1978, *Superstudio: the Middelburg Lectures*, ed. V. Byvanck, De Vleeshal and Zeeuws Museum, Middelburg, Netherlands; 43-52.
- LA PIETRA, U. (1972) The Domicile Cell: A Microstructure within the Information and Communications Systems, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 226-31.
- LEÓN, A.M. (2008) The Boudoir in The Expanded Field. *Log* (11) 63-82.
- LYNDON, J. (1973) Book Review: Italy: The New Domestic Landscape. Achievements and Problems of Italian Design, *Urban Studies* 10(2) 282-4.
- MARI, E. (1972) [Project Definition of Enzo Mari], *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 263-5.
- MUTLU TUNCA, G. (2009) *Doubling: "Italy the New Domestic Landscape" as a Historical Project*, unpublished Ph.D. Dissertation, METU, Ankara.
- MUTLU TUNCA, G. (2013) A "Historical Project": Doubling INDL Exhibition Catalogue, *METU Journal of the Faculty of Architecture*, 30(2), 195-214.
- NEIRA, J. (2017) Mario Bellini speaks to Designboom about his 1972 'Kar-a-Sutra' concept car. *Designboom*. [<https://www.designboom.com/design/mario-bellini-kar-a-sutra-concept-car-01-20-2017/>] Access date (22.03.2022).
- PARGA, M. (2015) SUPERZOOM, Italy and the Radical Commitment, *Constelaciones* (03) 14-5.
- QUESADA, F. (2011) Superstudio 1966-1973: From the World Without Objects to the Universal Grid, *Footprint* (8) 23-34.
- ROSELLI, A. (1972) Mobile House, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 182-9.
- ROSSI, C. (2014) Architecture Goes Disco, *AA Files* (69) 138-45.
- SCOTT, F.D. (2003) Involuntary Prisoners of Architecture, *October* (106) 75-101.
- SCOTT, F.D. (2004) Italian Design and the New Political Landscape, *Analyzing Ambasz*, eds. J. D. Dodds, E. Ambasz, & M. Sorkin, Monacelli Press, New York; 109-56.
- SCOTT, F.D. (2007) *Architecture or Techno-utopia: Politics after Modernism*. MIT Press, Cambridge, London.
- SOTTSASS, E. (1972) [Project definition of House Environment], *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 162-9.
- SUPERSTUDIO (1972) Description of the Microevent/Microenvironment, *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 242-51.

- TAFURI, M. (1972) *Design and Technological Utopia, Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 388–404.
- Telematic House – Living Cell – Ugo La Pietra*. (n.d.). Ugo La Pietra. [https://ugolapietra.com/en/the-1970s/telematic-house-living-cell/] Access Date (22.03.2022)
- TURAN, A.B. (1995) *Production of a Discourse: Italian “Neo-Rationalism” as Case Study*, unpublished Ph.D. Dissertation, Cornell University, New York.
- WILSON, S., CURL, J.S. (2015) *The Oxford Dictionary of Architecture*, Oxford University Press, Cambridge.
- WOLF, A. (2012) *Superarchitecture: Experimental Architectural Practices in Italy, 1963-1973*, unpublished Ph.D. Dissertation, University of California, Los Angeles.
- ZANUSO, M., SAPPER, R. (1972) [Project definition of Mobile Environment], *Italy: The New Domestic Landscape: Achievements and Problems of Italian Design*, ed. E. Ambasz, New York Graphic Society, Greenwich, Conn.; 192–9.

Alındı: 13.05.2022; Son Metin: 06.06.2023

Anahtar Sözcükler: Radikal tasarımcılar, tüketimcilik, seri üretim, tüketim toplumu, çevreler ve karşı çevreler.

TÜKETİME KARŞI TASARIM VE KARŞIT TASARIM: 1972 “İTALYA: EVE AİT YENİ BİR PEYZAJ” SERGİSİ

1960’lar ve 1970’ler Batı Avrupa’ında, mimarlık teori ve pratiğini Avrupalı tasarımcıların seri üretim ve tüketime yönelik radikal eleştirileri şekillendirmeye başlamıştı. Ancak, dönemin en provokatif ve ses getiren itirazı, bazı İtalyan Radikal tasarımcılar tarafından okyanusun öteki tarafında bulunan New York Modern Sanat Müzesi’nde Emilio Ambasz tarafından 1972 yılında düzenlenen bir mimarlık sergisinde dile getirilmişti: “İtalya: Eve Ait Yeni bir Peyzaj” (INDL). Bu sergi, Çağdaş Tasarım Tarihi’nde önemli bir eşik oluşturmuş ve mimarlık söylemlerinde artarak tartışılan tüketim karşıtı yaklaşımın bir simgesi olmuştur. Sergi için, Ambasz İtalyan imalatçılar tarafından üretilen 100’ü aşkın “obje” seçmiş ve bunları bahçe alanında özel tasarlanmış vitrinlerde sergilemiştir. Ayrıca, çevresel psikoloji, yerellik, kentsellik, mikro ve makro ölçekte konut, tüketim kültürü ve seri üretim gibi “özel tasarım programı” tarafından belirlenen kavramları yorumlayarak benzersiz “mikro çevreler” tasarımları için on bir İtalyan tasarımcı davet etmiştir. Müzenin bahçesinde sergilenen “objeler” büyük önem arz etse de etkinlik, İtalyan tasarımını Amerikan kamuoyuna tanıtan ilk örneklerden biridir- bu çalışma, çağdaş mimarlık teorisinde hala etkin bir konu başlığı olan “tasarım” ve “karşı tasarım” diyalektiğinin arka planında yatan tasarım felsefesini anlamak için Ambasz’ın belirlediği tasarım problemine karşı İtalyan tasarımcıların verdikleri karşıt yanıtlara odaklanmaktadır. Bu sebeple, “tasarım” kategorisi altında derlenen, altı tane İtalyan tasarımcının eklektik ve postmodern yaklaşımları ile “karşı tasarım” kategorisinde bulunan Radikal tasarımcıların provokatif reddedişleri analiz edilmektedir. Amaç, serginin görünür kıldığı bu söylemsel karşıtlığın, sonrasında tasarımcılar arasında artan tüketim karşıtı yaklaşımlar ve alternatif metodoloji arayışları üzerindeki etkisini daha iyi anlamaktır.

DESIGN AND COUNTER DESIGN AGAINST CONSUMPTION: 1972 “ITALY, THE NEW DOMESTIC LANDSCAPE” EXHIBITION

In Western Europe, the 1960s and 1970s covered the radical criticism of some European designers against mass production and consumption. Several Italian Radical designers raised the most compelling objection at an exhibition on the other side of the ocean: “Italy: The New Domestic Landscape” (INDL), curated by Emilio Ambasz in the Museum of Modern Art, New York, in 1972. INDL marked a significant moment in contemporary design history. For the show, Ambasz selected more than a hundred “objects” produced by Italian manufacturers and displayed them in specially designed cases in the garden area. Moreover, he invited eleven Italian designers to create unique “microenvironments” by interpreting concepts assigned by a “special design program,” such as environmental psychology, locality, urbanism, micro and macro-scale housing, consumerism, and mass production. Although the “objects” displayed in the garden were of great importance - since the event was one of the first instances of Italian design’s introduction to the American public- this study concentrates on the contradicting responses of Italian designers, under headings “design and counterdesign as postulation” for understanding the design philosophy behind the appearance of “design versus non-design” dialectics of that era, which is still a recognized topic in contemporary architectural theory. This study, therefore, analyzes the eclectic and postmodern approaches of six Italian designers in the “design” category and the provocative denials of Radical designers presented under the “counterdesign” category. It aims to understand better the impact of this discursive opposition made visible by the exhibition on the anti-consumerist approaches and the search for alternative methodologies, which subsequently increased among designers.

AYSU BOYSAN; B.Sc., M.Sc.

Received her B.Sc. And M.Sc. in interior architecture from Çankaya University Faculty of Architecture (2015-2018). Major research interests include interior architectural design, architectural exhibitions, micro-environments, and color in exhibition design.

GÜLRU MUTLU TUNCA; B.Arch, M.Arch, PhD.

Received her B.Arch from Gazi University Faculty of Engineering and Architecture (1997). Earned her M.Arch. and PhD. degrees in Architecture from Middle East Technical University Faculty of Architecture (2001-2009). Major research interests include postwar architectural theory, history and criticism, architectural exhibitions, architectural design and design studio education. gulru@cankaya.edu.tr

UNDERSTANDING, INTERPRETING AND PRESENTING HERITAGE SITES THAT LACK INTEGRITY: THE CASE OF THE OLD ARİFİYE VILLAGE INSTITUTE CAMPUS (1)

Hande SAVAŞ OKUMUŞ*, Figen KIVILCIM ÇORAKBAŞ**

Received: 07.02.2022; Final Text: 26.05.2023

Keywords: Arifiye Village Institute; early republican period; integrated conservation approach; on-site digital presentation techniques; heritage interpretation and presentation.

1. This paper is based on the master's thesis of the first author (Savaş, 2021). The second author is the advisor of the thesis. Both authors developed the subject further in this article.

INTRODUCTION: NEW TECHNOLOGIES AND THE CONSERVATION OF HERITAGE SITES THAT LACK INTEGRITY

The terms “authenticity and integrity,” which have long been sharing the leading roles in the evaluation of heritage sites for inclusion in the UNESCO World Heritage List, are two key concepts that are intrinsic to the idea of heritage. According to the operational guidelines, all heritage sites with cultural values must meet the conditions of integrity and authenticity (UNESCO, 2021). Authenticity is defined concerning the inclusive and relative approach of the Nara Document on Authenticity (1994), underlining that the definition of the authenticity of cultural property can change from culture to culture, therefore, should be handled with a community-based approach. Keeping in mind the relativity of the communities' varying approaches to heritage values, authenticity may be encapsulated in various attributes including form, design, materials, functions, traditions, location, and setting, language, intangible heritage, spirit, and feeling (UNESCO, 2021). On the other hand, integrity is established on the concepts of “wholeness and intactness of natural and/or cultural heritage and its attributes” (UNESCO, 2021). Remarkably, both authenticity and integrity are seen as indispensable for cultural heritage sites, whereas only integrity is considered necessary for natural sites. Hence, authenticity is an exclusively cultural attribute, while integrity corresponds to both natural and cultural environments. According to the 2021 version of the operational guidelines, a heritage property with integrity reveals the following aspects:

“a) [It] includes all elements necessary to express its Outstanding Universal Value;

b) [It] is of adequate size to ensure the complete representation of the features and processes which convey the property's significance.” (UNESCO, 2021, 31)

* *Corresponding Author*; Department of Architecture, Faculty of Architecture, Bursa Uludağ University, Bursa, TÜRKİYE; Design Programs, Architectural Restoration Program, T.C. İstanbul Şişli Vocational School, İstanbul, TÜRKİYE.

** Department of Architecture, Faculty of Architecture, Bursa Uludağ University, Bursa, TÜRKİYE.

Discussing the inclusion of the term “integrity” in the World Heritage discussion, Stovel (2008) points out that the term was discussed more elaborately in the scope of the 2003/4 revisions of the operational guidelines. Before the referred revision, the condition of integrity was considered necessary only for natural sites (UNESCO, 2002), whereas, after 2005, integrity was a condition that both natural and cultural sites registered to World Heritage List should have. Stovel (2008), explains that the dominant effect for the inclusion of integrity as a necessary condition for heritage sites to be registered to the World Heritage List lies in the approach of the American National Register of Historic Places to the concept of integrity. According to the American system, integrity refers to the ability of a cultural property to convey its significance (Stovel, 2008). As a result, the two terms, authenticity and integrity are strongly linked in the common belief that the capability of conveying significance is a main quality of heritage assets. Therefore, in a way, authenticity and integrity are not two completely separate concepts but overlaps, though partly, on the expectation that heritage assets divulge heritage values through their authenticity and integrity.

According to the Burra Charter, “cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations” (ICOMOS-Australia, 2013, 4). The charter’s community-based approach highlights that “cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places, and related objects” (ICOMOS-Australia, 2013, 4). Therefore, significance is not only embodied in the tangible aspects of heritage but also inherent in the intangible aspects like associations, meetings, memory, and records.

The Valetta Principles underline that historic towns and urban areas are composed of tangible elements like “urban structure, architectural elements, the landscapes within and around the town, archaeological remains, panoramas, skylines, view lines and landmark sites” and intangible elements like “activities, symbolic and historic functions, cultural practices, traditions, memories, and cultural references that constitute the substance of their historic value” (ICOMOS, 2011, 3). In other words, heritage sites are a composite of tangible and intangible cultural qualities. As a result, the loss of the integrity of the tangible elements of a heritage site can necessitate more emphasis on its intangible aspects, their conservation, interpretation, and representation. In this context, in order to develop a systematical approach to the concept of integrity, the integrity of a heritage site can be discussed separately though interrelatedly in tangible and intangible dimensions. Similar to the Nara Document’s (1994) search for authenticity in various qualities of heritage properties, the condition of integrity can be evaluated as the integrity of tangible qualities like form, design, material, techniques, location, and setting, as well as the integrity of intangible qualities like use and function, traditions, spirit, and feeling.

This paper argues that, in case of the loss of the integrity of tangible qualities of a heritage site, a thorough study of the documentation, interpretation, and *in situ* presentation of the site’s intangible cultural qualities proves an appropriate methodology to enable the site to convey its significance. With this approach, the few physical remains of the heritage site can be linked with meanings and significance and can be conserved. This can be an alternative way to restore integrity, which is essential for the conservation of cultural heritage sites, as it ensures that they remain a valuable source of information about past cultures, societies, and traditions.

Considering that when a heritage site lacks integrity, its authenticity is threatened, leading to a loss of interest and support for conservation efforts, the restoration of integrity by the *in situ* presentation of the intangible heritage qualities can promote the appreciation of the site's cultural and historical values.

Cultural and natural heritage sites that can be included in the UNESCO World Heritage List under the criterion of integrity need to have the conservation, interpretation, and presentation of their tangible and intangible values considered together, and there have been several significant studies and discussions on this issue in contemporary conservation literature (Parent, 1979; Jones, 2010). These discussions were instrumental in changing the generally accepted approach to heritage evaluation and in creating procedures for conducting a more inclusive heritagization process, which covered heritage sites' physical dimensions until the early twenty-first century (Jokilehto, 2006; Eraslan, 2020). As a result, an integrated conservation approach has become more prominent in the practice of conserving heritage sites. In the Convention on the Conservation of Intangible Cultural Heritage, which was adopted by UNESCO in 2003, intangible cultural heritage is defined as the practices, representations, narratives, knowledge, skills, and related tools, as well as the materials and cultural spaces, that communities, groups, and, in some cases, individuals consider as part of their cultural heritage (UNESCO, 2003). However, the intangible cultural heritage can also be considered more extensively as the intangible aspects of architectural and urban environments and the collective memory linked to spaces and places, which are passed from the past to the present and continue to exist today. In this context, the intangible values of urban heritage constitute a part of intangible heritage and living heritage (Deacon, 2004; Kivılcım Çorakbaşı *et al.*, 2018).

Similarly, heritage can be defined both physically and through aesthetic, historical, scientific, and social values by associating them with the heritage of the society and people who live in that place and who create social memory, identities, and memory values (Vecco, 2010). As a result, intangible values such as the place's location, function, and importance were part of the Nara Document on Authenticity, which was drafted in 1994 as a way to determine the values of cultural heritage sites (ICOMOS, 1994). Evaluating the location of cultural heritage sites in the context of their local characteristics, traditional values, and the religious and symbolic characteristics of the people ensures an integrated identification and evaluation (ICOMOS, 1994). Supporting this idea, Jokilehto (2006) develops the concept of integrity by addressing heritage sites in terms of structural, functional, and visual integrity. According to Jokilehto (2006), the relationship of the heritage with its location, social interaction, the use of natural resources, and the movements of people define the social-functional integrity that develops over time. The heritage site constitutes a concrete expression of this integrity spatially. For instance, on a building scale, the original construction and its transformation over time give meaning to the spatial-environmental integrity of the building. On the other hand, visual integrity may refer to the aesthetic aspects represented by the heritage site (Jokilehto, 2006).

Underlining that cultural heritage gains meaning only with its values expressed by society, Munjeri (2004) states that tangible heritage can only be comprehended with intangible values. The strong relationship between

the community and the heritage site is emphasized in this respect. As a result, the relationship between heritage, place, and society is manifested by the physical features of the place together with intangible values (Kaufman, 2013). The traditions expressed through people's narratives, stories, and memories can give heritage experts invaluable insights into the psychological bonds which connect people with places and define their heritage values over time (Kaufman, 2013). Extending the discussion of the relationship of heritage and place to the concept of spirituality, Orduña (2015) discussed that the symbolic meaning of monuments is defined by a concept of spirituality that transcends historical borders. Additionally, Vit-Suzan (2014) stated that the social and historical evaluation of heritage is essential in understanding and defining the values of heritage. As a result, the concept of integrity of heritage is the integrity of tangible and intangible aspects, as well as the integrity of the heritage asset, its place, and its meanings.

Not all sites with cultural heritage values have integrity. The issue of preserving heritage sites that have lost their integrity opens new possibilities for creative *in situ* interpretation and presentation processes in contemporary conservation. It is possible to explain, interpret, and present the heritage values that stem from collective memory and identity through *in situ* digital presentation methods that have resulted from technological developments in a number of visual, textual, spatial, auditory, and imaginary movements (Thyssen and Priem, 2013). The "Interpretation and Presentation of Cultural Heritage Sites" (known as the Ename Charter) prepared by ICOMOS (2008) defines the basic principles of interpretation and presentation as a tool for understanding the value of heritage by the community and creating awareness of conservation in heritage conservation studies. This charter can be used as a framework for the *in situ* preservation of tangible and intangible attributes in heritage sites, the development and evaluation of digital presentation methods for understanding heritage. In this context, its critical role in the application and development of contemporary conservation methods in cultural heritage areas is addressed in terms of access, resource diversity, context, authenticity, sustainability, research, education and evaluation (ICOMOS, 2008). The *in situ* presentation and expression of intangible cultural qualities provide awareness for conservation efforts, especially in heritage sites that have lost their integrity. In the protection of cultural heritage, monitoring the heritage or providing easy access to information about a site or structure gains importance in conservation studies (Blake, 2010; Güleç Korumaz *et al.*, 2011). Therefore, planning the interpretation and *in situ* presentation of the heritage sites simultaneously with the implementation of conservation decisions is considered an important step. Today, with the development of technology and information systems, the *in situ* presentation of heritage sites in the field of conservation can be provided more effectively through visual presentation techniques and modeling (Töre, 2010). The use of sensors, data capturing technologies, 3D modeling, virtual reality, augmented reality, improved reality, real-time 3D graphics, digital reconstruction, and other digital methods contribute significantly to the documentation, *in situ* presentation, and conservation of cultural heritage (Remondino and Rizzi, 2010; Töre, 2010).

The absence of concrete traces in heritage sites that lack integrity makes it difficult to perceive heritage values. A correct perception of a site's heritage is crucial in conservation studies, which require a proper and inclusive understanding of the tangible and intangible qualities of a place. In most

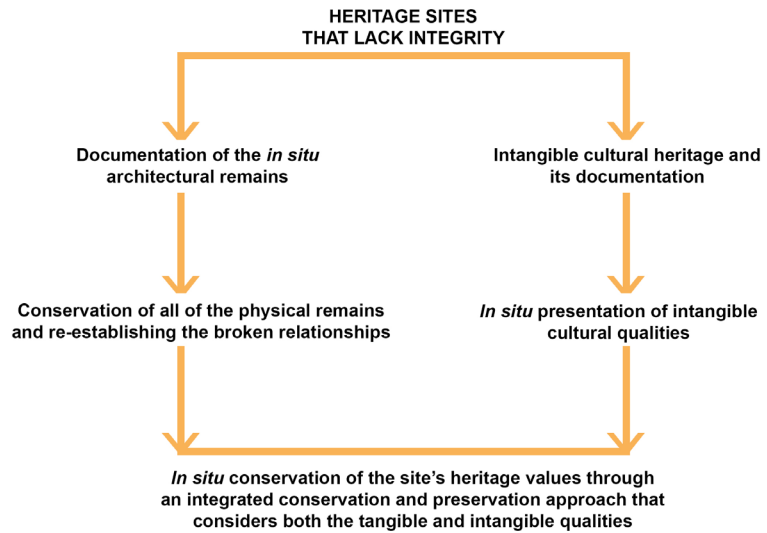


Figure 1. Proposal for a conservation approach to heritage sites that lack integrity (prepared by the authors).

heritage sites that lack integrity, much effort is put into making heritage values visible and understandable. For instance, to conserve cultural heritage that has almost disappeared in southwest China, considerable efforts were made to raise the awareness of local politicians, administrators, and the public. The conservation team planned to create formats suitable for lost cultural heritage values' digital and online visualization, such as documentaries, still images, and streaming media clips. These works were presented through a multilingual website accessible to internet users worldwide. Moreover, Geographic Information Systems software (GIS) was used to present the disappearing cultural and natural heritage (Wang, 2006). Since the intangible values of heritage sites that have lost their tangible heritage are related to human activities, they continuously change over time. This dynamic situation makes it difficult to protect intangible heritage, but it brings the advantages of digital technologies to the forefront because of their capacities to co-representing space and time and the past and the present. The development of information technologies, especially digital photography, three-dimensional information systems, multimedia, and network technology applications, provides strong technical support for the digital representation of both tangible and intangible qualities of cultural heritage (Fan, 2018). Fan (2018) underlines that realistic 3D modeling can revitalize ancient cities, archaeological sites, and excavation sites. To conclude, using digital technologies, especially for the *in situ* presentation of heritage sites that lack integrity, can be an efficient and beneficial way to conserve, interpret, and experience heritage sites.

Scope of the Study: The Arifiye Village Institute Campus

The Arifiye Village Institute, which is a heritage site that has been largely destroyed, requires an integrated conservation approach for the presentation and interpretation of the tangible and intangible cultural heritage values. The Arifiye Village Institute is part of the Village Institutes project, an educational revolution that was carried out to promote a modern identity and develop the country after the establishment of the Turkish Republic. The idea of modernizing the countryside by unifying education and production defined a new production-oriented way of life—one inspired by village life. The Village Institutes project was approved by Law no. 3803 on April 17, 1940, under the leadership of Minister of

National Education Hasan Ali Yücel and General Manager of Primary Education İsmail Hakkı Tonguç (T.C. Official Gazette, 1940). The Village Institutes project aimed to train village primary school teachers and was based on practical training through various processes: learning by doing and conducting real-life tasks, including building the campuses themselves (Türkoğlu, 2000; Altunya, 2012). Village Institutes were established in twenty-one different areas of Turkey; each institute's campus was designed to meet the specific needs of the place. The Arifiye Village Institute could not maintain its integrity to the present day because the campus boundaries were disregarded, and the majority of the institute's buildings were destroyed. Only one building on the campus has been registered as cultural heritage. This study discusses the former Arifiye Village Institute campus, an example of an institute that has both lost its integrity and is registered as cultural heritage by the Ministry of Culture and Tourism.

Methodology

This paper examines the historical, educational, and architectural values of the Arifiye Village Institute and addresses its tangible and intangible cultural heritage values through restitution analyses, historical surveys, site surveys, and oral interviews. The spatial transformation of Arifiye Village Institute, which has lost its integrity, has been examined through studies in personal and institutional archives, oral interviews, overlapping historical and current aerial photographs, and old photographs. One of the original aspects of this study is the discovery that, in the 1930s and 1940s, the Arifiye Village Institute campus was spread out over five different areas. All five different campus locations are identified in this study.

First, the historical periods of the institute were determined by analyzing primary visual and written resources like aerial photographs between 1940-1992, which were accessed from the archive of the General Directorate of Maps of the Arifiye Village Institute campus. Additionally, old photographs of the campus, which describe the daily life on the campus and in the institute buildings, were utilized for determining the spatial changes of the institute campus. Old and new photos were compared and digitally overlapped on different layers in order to analyze the change in buildings and open areas. Two buildings still standing today were photographed and architecturally documented. Multiple field studies were carried out on the Arifiye Village Institute campus between 2020 and 2022. The graduates of educational institutions that functioned on the campus in different historical periods were interviewed and their memories of the spatial and functional changes of the campus over time were recorded and spatially and locationally documented. Similarly, in-depth interviews were conducted with teachers who used to work on campus. Interviews were held with the following people: (i) Yavuz Ali Sakarya, who was an English teacher at Arifiye Primary Education School between the years 1969-1975; (ii) Gül Aygün, who is a 1992-graduate of Arifiye Anatolian Teacher High School; (iii) Bilgin Bil, who was Necmettin Erbakan Science High School Deputy Principal in 2020; (iv) Ayhan Köksal, who is a 1969-graduate of Arifiye Primary Teachers School; (v) and Ali Cengizhanoglu, who worked as a teacher in Arifiye Village Institute between 1949-1954. In the interviews, the main themes discussed were the Village Institute educational system, the spatial change of the campus over time, the use of space, and the relationships between the heritage site and the existing educational systems.

Since the Arifiye Village Institute campus is a heritage site with very few physical traces from its original state, it has been competent to understand its heritage values. In heritage sites such as Arifiye Village Institute, which lack physical integrity, primarily the expression and presentation of the intangible heritage qualities prioritize. Therefore, in similar cases, the use of digital methods that facilitate the understanding and conveying the cultural and historical significance of heritage has become quite common in recent years. Virtual Reality (VR) and Augmented Reality (AR) applications offer realistic images that can define historical states of space and life in the virtual environment.

As a result, understanding the heritage of Arifiye Village Institute can be achieved by simulating the buildings built during the institute period, reflecting them on various digital milieus, and presenting them on-site. In the scope of this study, to illustrate a digital presentation method, old and new photographs were overlapped in digital photo collages in different layers, and a comparison of past and present daily practices was made (**Figure 16,17,18,19**). It should be noted that there are myriad digital representation techniques, which can represent the intangible cultural and historical aspects of a heritage site and help restore its integrity by representing the values of the site, otherwise unperceived.

THE LEGACY OF THE VILLAGE INSTITUTES

The Village Institute project, which was part of the national educational policy to modernize the countryside and develop the nation in the early Republican period (despite limited resources), represents the struggle for enlightenment. During this period, spatial constructions that shaped life were prioritized to create a new societal identity. The period's architectural understanding was synthesized with modernizing international and national values and applied in practice. The use of local materials and traditional construction techniques in the spatial formation of Village Institutes reflects this architectural approach.

Many Village Institute campuses were originally designed through architectural project competitions, and some were built taking into consideration the existing environment and urban texture. Two of them were designed by the architect Mualla Eyüboğlu Anhegger. The Kızılçullu, Ernis and Cılavuz Village Institutes were established using the existing buildings on their campuses. The campuses of the Ortaklar and Pulur Village Institutes were designed by Mualla Eyüboğlu (Kıvılcım and Yeşiltepe, 2016). An architectural competition was opened in 1940 for twelve Village Institutes, including the Arifiye Village Institute. A competition was opened in 1941 for the Hasanoğlan Village Institute and in 1943 for the İvriz and Pamukpınar Village Institutes (Çetiner, 2010). In most institute campuses built as a result of architectural project competitions, educational services were primarily offered in the instructor course or teacher's school buildings (Balkır, 1974).

The opening of architectural project competitions for the design of Village Institutes is one of the important achievements of the Republican period. The ideas of social development and modernization promoted by the Republican administration gained tangible value through architectural activities (Aslanoğlu, 2001). Public buildings from the Republic's early years, the influences of foreign architects invited to the country, and architectural project competitions brought important developments

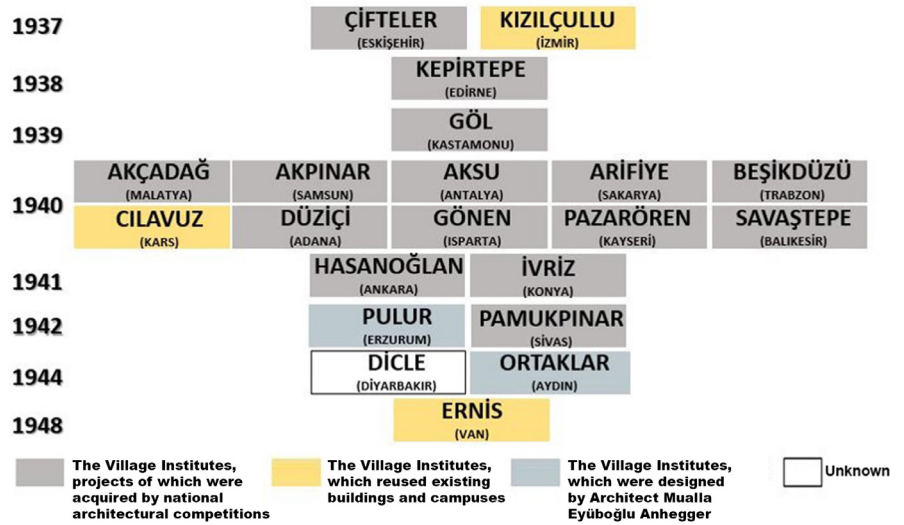


Figure 2. The creation and design stages of the Village Institutes.

in architecture during this period. The spatial formation of the Village Institutes was also carried out through national architectural project competitions and was designed in a way that focused on science, technique, and art. With the approval of law no. 3803, the details of the architectural project competitions opened by the Ministry of National Education for Village Institute campuses were published in the 70th issue of the *Tebliğler Dergisi* on May 13, 1940 under the title “Competition Specification for Advance Projects of Village Institute Buildings” (Anonim, 1940; Keskin, 2012). Keskin (2012) notes that the Village Institute architectural project competitions were the first of their kind in Turkey. The formation of the spatial production of Village Institutes with architectural project competitions indicates a rational and democratic system in which science, art, and technical methods were used (Keskin, 2012). In this respect, the construction of the Village Institute buildings, a concrete example of modern ideology, coincided with the modern understanding of the period and the ideal of a production-oriented development that was open to innovation and prioritized local development.

THE OLD ARIFIYE VILLAGE INSTITUTE CAMPUS AND ITS SPATIAL TRANSFORMATION

The Arifiye Village Institute had settlements in five different areas, which is a rarely seen situation in the Village Institutes’ campus planning (2) (Figure 4). In addition, it is one of the least conserved settlements in the system of old Village Institute campuses. Although only a few traces remain, the tangible and intangible cultural heritage needs to be protected holistically, along with its values. In heritage sites that have lost their integrity, it becomes difficult to understand and explain the unity of tangible and intangible heritage. Therefore, in this study, *in situ* digital presentation methods are recommended as a practical solution to explain and present the integrated conservation approach.

2. Some other Village Institutes, for instance, Aksu and Çifteler institutes, unite several different areas in a campus system, which function as a whole (Çetin, and Kahya, 2017; Kivilcim Çorakbaşı, and Sümertaş, 2014). However, having areas in five different locations, one being near the lake and another being near the train station, the Arifiye Village Institute campus is a unique case.

In this study’s original approach, the Arifiye Village Institute was examined by determining historical periods for clarifying the institute’s spatial transformation over time (Savaş, 2021). The spatial formation of the Arifiye Village Institute campus consisted of instructor course buildings, as well as those from the architectural project competition and

3. Recai Akçay, the architect of the Arifiye Village Institute campus, was born in 1909 in Bartın. Akçay graduated from the Fine Arts Academy in 1931 and worked in Ernst Eglı's office between 1931 and 1933. Additionally, Akçay won the first prize in the Adana Düziçi Village Institute architectural project competition and served as a jury member in many architectural project competitions, including for the Eskişehir Train Station and the Istanbul Palace of Justice (Can Bilge, 2017). Akçay died in Ankara in 1967 (Menderes, 1968, 32).

the ones that were built later. The Arifiye Village Institute started the training process in its early years using the instructor course buildings. Later, the campus expanded to different locations, including the places where the architectural competition project was implemented and other areas that were designed to meet the specific needs of the various educational programs (Figure 4). The first prize in the Arifiye Village Institute national architectural project competition went to the architect Recai Akçay (3). Leyla A. Turgut came in second place; Orhan Safa, Adnan Kuruyazıcı, and Behçet Ünsal came in third place; and the architect Tahir Tuğ came in fourth (Keskin, 2012, 114). The Arifiye Village Institute campus architectural project's specifications included a school building, a workshop, a laundry area, a bathroom, a meeting area, a kitchen, a management building, housing for teachers, and a barn and coop. A total of 55 buildings were listed at Arifiye Village Institute on September 16, 1940, the project delivery date (T.C. Maarif Vekilliği, 1940). However, Recai Akçay's project was only partially implemented at the Arifiye Village Institute campus (Balkır, 1974).

The embodiment of the institute's idea during the formation phase of the Village Institutes project, which was intended to work toward the development of society, was carried out in an experimental method. In the village, teacher schools and instructor courses were the preliminary stages of the Village Institutes project, and different training methods were tried, all of which laid the groundwork for the Village Institutes (Şimşek and Mercanoğlu, 2018, 265). Instructor courses were first opened in Çifteler and Kızılçullu (Türkoğlu, 2000; Altunya, 2020). Afterward, the Çifteler ve Kızılçullu instructor courses were converted into village teacher schools.

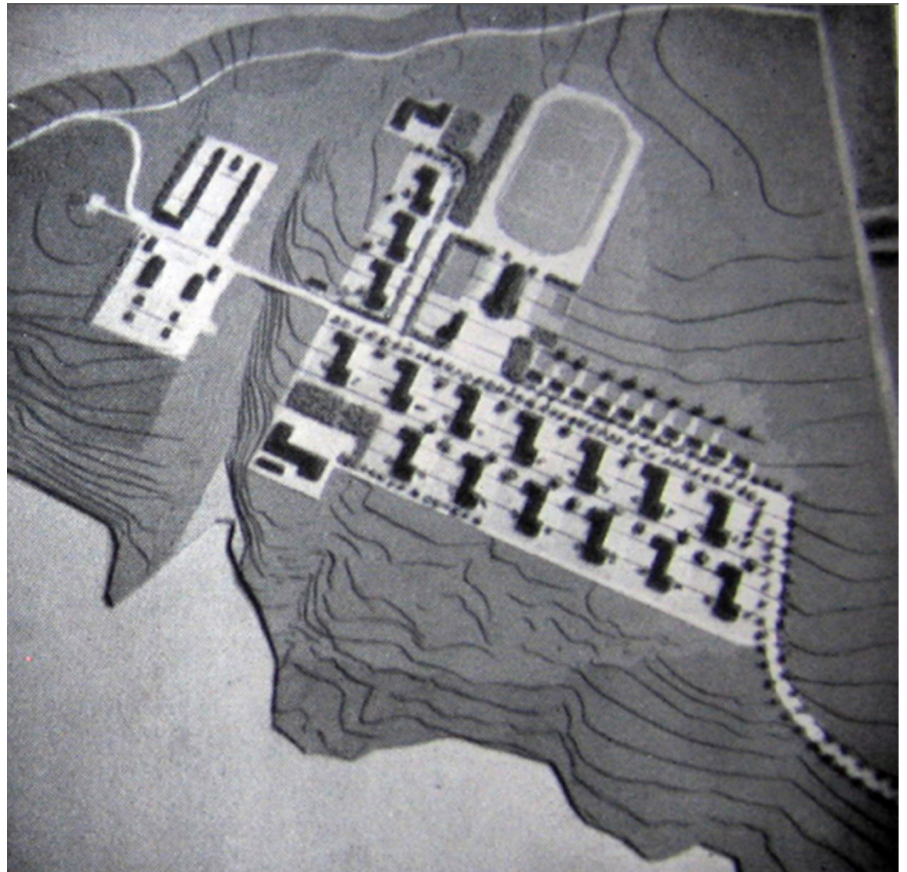


Figure 3. The design of the winner of the Arifiye Village Institute competition (Baysal, 2006).

In addition to these two village teacher schools, Kepirtepe was opened in 1938, and the Göl teacher school was opened in 1939. During these years, instructor courses were opened in Arifiye, Beşikdüzü, Cılavuz, Akçadağ, Pazarören, Aksu, Düziçi and Gönen (Altunya, 2012). Village teacher schools and instructor courses were converted into Village Institutes with the Village Institutes Act, approved on April 17, 1940 (Altunya, 2012; 2020). The educational history of the Arifiye Village Institute dates back to 1937 when the instructor course was first established (on May 1); it was named the Arifiye Village Institute and Instructor Course with the approval of the Village Institutes Act (Aydoğan, 2015; Aydoğan, 2019).

The educational system of the Village Institutes was designed around job training, and students learned by doing, developed life skills, and strengthened their ties to the local environment. Thus, the connection established by the institutes with their location forms the basis of the idea of reviving the villages through this educational system (Türkoğlu, 2000, 219). Courses in culture, technique, and agriculture were given jointly. In addition, training specific to the location of the institutes was included. This flexibility in institute education allowed attendees to deepen their connections to the area and develop each institute in different fields (Şimşek and Mercanoğlu, 2018). Due to the proximity of Arifiye Village Institute to Lake Sapanca, students were also taught fishing, swimming, and lifeguarding. The fish kept by the students were consumed in the cafeteria and sold in the surrounding markets, which contributed to the institute's budget. In addition, the local community was introduced to fishing, which fits neatly into the idea of "reviving the village" (Kirby, 1962; Balkır, 1974). Another of the training areas carried out in the institutes to benefit the villages was in the field of health. Along with six other institutes, a health branch was established at the Arifiye Village Institute (Balkır, 1974). The developing educational system specific to the Arifiye Village Institute has also shaped its spatial formation. The *balıkthane* building, built to maintain lakeside fishing activities, is an example of the location-specific spatial formation of the education system.

Arifiye Village Institute Settlements

As discussed above, the Arifiye Village Institute campus consists of five interconnected locations. Different from the examples of Çifteler, which has two different campus areas, and Aksu, which has different agricultural areas in diverse zones, the Arifiye Village Institute campus is a unique case due to its five separate campus areas with various functions. This spatial formation that is diffused in a broader region strengthened the relationship between the institute's community and the local communities around the institute's campuses. Within the scope of the flexible and practical principles of the institute education, the start of fishing activities in Sapanca Lake coincided with the ideals of developing, producing, and participating in the country's economy from a local level. The reliance on national architectural project competitions for the Village Institute campuses highlights that period's priority of a rational and scientific approach. Furthermore, limiting the competitions to local (not foreign) architects shows an orientation towards national values.

The buildings for the Arifiye instructor course, which date to 1937, were the campus's first buildings. Initially, the institute used these buildings and other structures built on this land; later, the implementation of the winning project from the architectural competition required the purchase of new land (Balkır, 1974; Aydoğan, 2019). As a result, the Arifiye Village

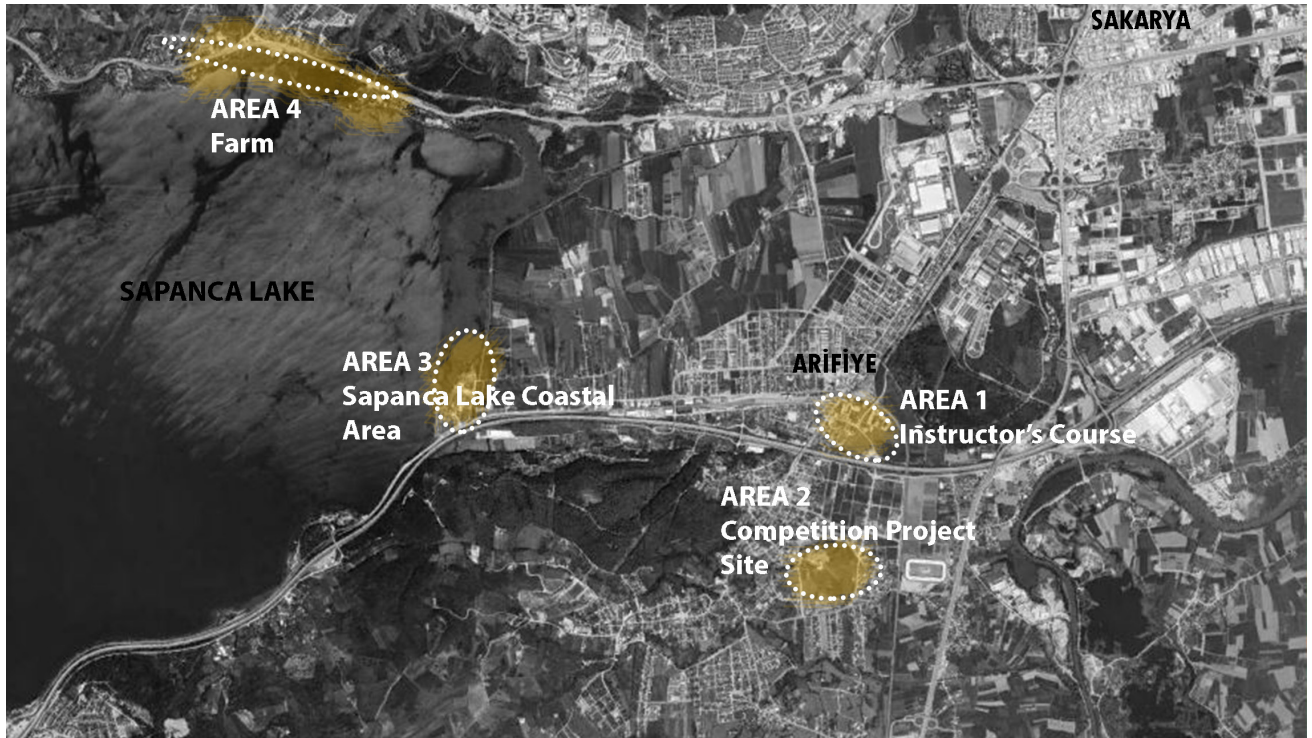


Figure 4. The Arifiye Village Institute campus areas. The location of the fifth area is unknown (Savaş, 2021)

Institute campus consisted of five different residential areas: the area where the instructor course buildings are located, the area where the architectural project was built, the Sapanca Lake coastal area, the farm area, and the recreation area (**Figure 4**) (Savaş, 2021).

The instructor course area, defined as Area 1 on the campus map, is on land bordering the railway, near the Arifiye train station. Tonguç traveled all over the country to help select the locations for the institute campuses and noted their proximity to provincial centers, railways, and railway stations (Türkoğlu, 2000, 173–175). The Arifiye Village Institute campus is located within a reasonable distance of the city center and is close to the transport lines. Classrooms, dormitories, kitchens, and dining hall buildings were later built (during the Village Institute period) in this same area. The area to the east was used as an apple orchard, and students practiced their agricultural skills there. Today, there is one remaining building built during the Instructor Course period and one built during the Village Institute period.

The land where Recai Akçay's (the national architectural project competition winner) project was implemented is marked as Area 2 on the map. The buildings in the competition project area started to be built after 1940. The buildings were constructed collectively (*imece*), by institute students, teachers, and building masters, and consisted of school buildings, housing, bathhouses (*hamam*) and workshops (Balkır, 1974; HGM Archive). The school buildings and teacher houses were built according to Recai Akçay's project plan. At the same time, baths and workshops were also built independently of Akçay's project to meet the primary needs of students in this area (Balkır, 1974). Akçay's architectural project was only partially applied to the competition project area. The economic conditions caused by World War II made it difficult to obtain supplies, and the formation of Village Institutes changed depending on the country's

political environment. Village Institutes in Akçadağ, Beşikdüzü, and Ivriz were also not fully built in accordance with their winning projects' specifications (Kıvılcım Çorakbaşı and Atalay, 2017; Aladağ, 2019; Kıvılcım Çorakbaşı, 2020). From studying old aerial photographs, it is known that the construction of functional buildings, such as bathhouses, was given priority, even before the school buildings were completed. This indicates that the construction process continued under challenging conditions and that although the entire project was not implemented, priority was given to the institute's ability to meet critical needs as quickly as possible. An example of this situation is the bath building built in 1948 by the Arifiye Village Institute students and Bedri Birol, foreman of the Beşikdüzü Village Institute (Figure 5). At the same time, problems arising from a lack of construction materials were solved using traditional construction methods and local materials. For example, the institute's students carried out brick production to complete the construction of the buildings (Balkır, 1974), its layout was adapted to the opportunities and limitations of the period, and practical solutions were developed to solve any problems.

The bath building built in the competition project area consists of a washing place, a changing area, and a laundry room. The interior of the bath, which is domed, is covered in marble and has a *göbek taşı* in the middle (Aydoğan, 2019). The baths and housing were still in use in the 1970s despite the closure of the institute in 1954 (Sakarya, 2020; Aydoğan 2020).

The Arifiye Village Institute then spread to the Lake Sapanca area (Area 3), which was part of the initiative for Village Institutes to offer training tailored to the local environment. Swimming, lifeguarding, and fishing lessons were given in Lake Sapanca, and a building was built on the lakeside at the request of the students (Figure 6). The students of the institute took an active part in the construction of the *balikhane* building, which was opened on May 6, 1942 (Balkır, 1974). There was a dormitory and study area on the first floor where the on-call students could stay. Stones and sand by the lake were used to construct the fishing house. Students transported the bricks by hand from a distant place, which was forty-five minutes away (Balkır, 1974; Aydoğan, 2019, 192).

Another land included in the institute campus was the farm area (Area 4). Although its precise location is unknown (Figure 7), it was located in the region north of Lake Sapanca, now known as Esentepe (Balkır, 1974; Aydoğan, 2019). It was purchased to expand the scope of the agricultural

Figure 5. Construction of the bath in the competition project area and a photograph of the bath's interior in 2015 (Karabey Aydoğan Archive).





Figure 6. The *balikhane* building on the shores of Lake Sapanca (Karabey Aydoğan Archive).



Figure 7. The general area where the institute's farmland was located, a view from Lake Sapanca (Karabey Aydoğan Archive).

courses given at the institute. It was an area of approximately 600 decares. A barn and a two-story dormitory building were built by the students so that students could stay in this area. They tended to vineyards and gardens, growing vegetables and fruits and taking care of livestock. After the closure of the institutes, the farmland was taken from the institute. A road was placed middle of the area, and then the state leased a part of the area to migrants from Bulgaria (Balkır, 1974; Aydoğan, 2019, 192).

The exact location of the rest center area (Area 5) at the Arifiye Village Institute campus is unknown. Süleyman Edip Balkır (1974), the founding director of the Arifiye Village Institute, described it as being designed near a restored old gas station that was previously used as a casino building in Kocaeli for touristic purposes (Balkır, 1974, 456). It was used as a gas station for a while after it was destroyed by an earthquake in 1943. The students rebuilt the floor and walls during the transformation of the building into a recreational center, and the ceiling was reinforced with supports. The ground floor of the two-story building featured a lounge, rooms, a kitchen, and toilets. There was an infirmary, a kitchen, rooms, and a terrace on the first floor. Additionally, the students built a pool in the garden (Balkır, 1974; Aydoğan, 2019).

The Arifiye Village Institute campus comprised five different areas. It was a holistic, functioning campus: the five areas worked in connection with each other and with the educational and training activities as a whole.

Arifiye Village Institute is different from other Village Institutes in that it has settlements in five different areas. The spatial organization, which was designed in accordance with the educational program of the Village Institutes during the Arifiye Village Institute period, continued to be used for a long time after the institute was closed. Oral interviews show that the spaces were actively used for educational and related service activities. Sakarya, who worked as an English teacher at Arifiye Primary Teachers School in the 1970s and stayed in the Village Institute lodgings with his family, expressed his satisfaction with the architectural characteristics of the institute's buildings and their different functions (Sakarya, 2020).

In addition to the institute buildings, which were built with the participation of students in the Arifiye Village Institute building; classes, road construction, canal construction, and brick material production were also carried out (Balkır, 1974). The road (Figure 8) that the Institute students wanted to build to get rid of the muddy path between Area 1 and Area 2 is still in use today (Figure 4).

Current State of the Old Arifiye Village Institute Campus

The Arifiye Village Institute is located in the Arifiye District of the province of Sakarya (which became a province in 1954) (Aydoğan, 2015, 18). The Arifiye Village Institute was closed in 1954 because of the decision announced in law no. 6234 to merge Village Institutes and primary teachers' schools (Balkır, 1974; Tonguç, 2012, 49). Today, although there are remarkably few original buildings left, the educational function continues to a certain extent (Figure 9).

The Arifiye Village Institute campus boundaries have decreased over time and are divided into different functions. Today, within the boundaries of the campus, there is Necmettin Erbakan Science High School, the Sakarya University Vocational School buildings, a gym, a parking lot, a park, and a municipality building (Figure 9). Only two buildings have survived among the original Arifiye Village Institute buildings: the central building (Figure 10) and one classroom building (Figure 12). Although one original housing (Figure 13) in Area 2 was standing until February 2021 (Savaş, 2021), it was used as a warehouse during the construction of a new school building and was demolished when the construction process was completed.



Figure 8. The road built by the students of the institute between Area 1 and Area 2 still preserves its traces today (Karabey Aydoğan Archive).

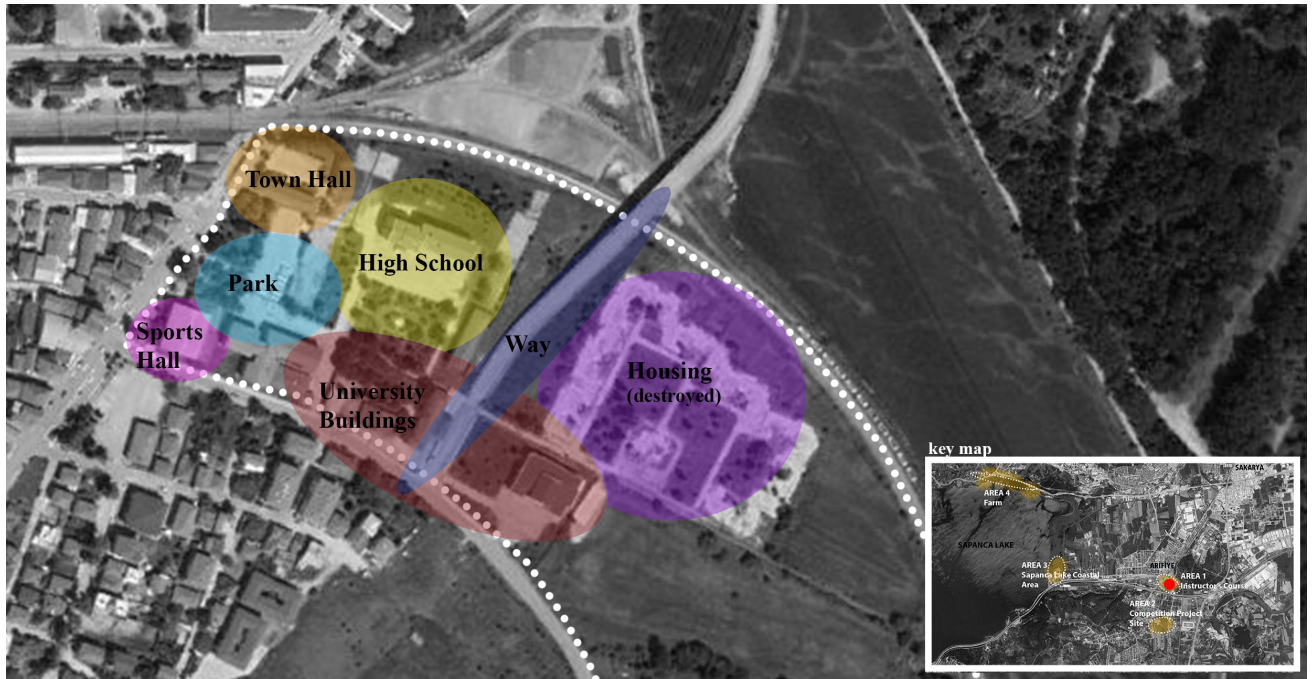


Figure 9. The functional distribution of the Arifiye Village Institute campus in 2020, (Area 1) (Google Earth, 2020).

Instructor candidates initially built the central building in 1937 (Balkır, 1974; Aydoğan, 2015). The Bursa Cultural and Natural Assets Conservation Board registered the building as a cultural asset on November 16, 2000, under resolution no. 8222 (Bursa KTVKK, 2000). It continued its educational function until 2008 when it began to be used as a local government building (Arifiye Municipality, 2020). It is a rectangular building, and on the northern façade, there are classrooms to the south of the single-corridor building. It consists of a ground floor and a first floor.



Figure 10. The instructor course's students built the central building in Area 1 (Karabey Aydoğan Archive; Savaş Archive).



Figure 11. A view of the central classroom building from the area used as a square during the institute period (Karabey Aydoğan Archive; Savaş Archive).

In the middle, there are two entrances, one in the front and one in the back. The back entrance of the building opens to a square where ceremonies and celebrations were held during the institute period (and to which the people of Arifiye were also invited). It is thought that the square was shaped due to necessities in the Village Institute life. This self-forming square has functioned as a gathering area and an area for entertainment, sports, celebrations, and ceremonies. Squares, a common spatial element of Village Institutes, highlight the unity of the buildings and space on the campuses.

The other building that has survived from the Village Institute period to the present day is the single-story, tile-roofed building (**Figure 12**), built in the Village Institute's last period (1952–1954). The construction date was discovered thanks to a comparative analysis of old photographs and old aerial photographs from the archives of the graduates. This building has changed over time and has been subjected to various interventions. In the original version of the building, the entrance to the building was made via a semi-open space located in the middle. This semi-open space, supported by vertical carriers, is now walled off. The building, which was only one-storey in its original form, is now used for educational purposes by Sakarya University of Applied Sciences and has two floors.

Figure 12. The classroom building was built during the period of the Village Institute, and its façade, number of floors, and the general layout have all changed (Karabey Aydoğan Archive; Savaş Archive).

Today, none of the Arifiye Village Institute campus buildings that were part of Recai Akçay's project have survived. The last surviving building was used as a warehouse during the construction of a new school and was demolished in February 2021 after construction finished. This building is one of five housing buildings built during the Village Institute period (**Figure 13**). According to Akçay's project, the students built the housing





Figure 13. Lodging from the Institute period (Karabey Aydođan Archive; Savař Archive).

buildings, which were placed side by side in a single direction, using a wooden skeleton system and bricks. This single-story building had a tile roof, similar to other institute buildings.

In addition to the two buildings that have survived, some of the tools from the institute's training programs and daily work have survived. The piano used in music lessons at the Arifiye Village Institute, a desk, one prize won in an athletic competition, and a cauldron and ladle used for cooking are exhibited in the Sakarya Eđitim Múzesi (Sakarya Education Museum). Although the Education Museum continued to function in a building on the institute's campus for many years, it was moved to Sakarya Anatolian High School in the Serdivan district in 2019. Bil, the deputy director of the campus, which continues its educational function as a high school today, stated in 2019 that he did not find it appropriate to move the museum, which displays the educational equipment of the Village Institute. Bil stated that the tools and equipment belonging to the Village Institute should be preserved and kept in the same area. Similar to this view, Aygün and Köksal also emphasized the importance of the institute's educational system and the value of the institute buildings on the campus (Aygün, 2020; Köksal, 2020). Aygün, who photographed and documented the destruction over time of the institute buildings that were constructed in the later periods, shared his sadness at the loss of these buildings (Aygün, 2020). In addition, to maintain the value of the institute and to ensure the graduates' unity, different events and alumni meetings are organized. There are heritage values attached to the site, particularly surrounding the importance of the campus's educational history and architectural heritage; they are still kept alive in various ways at the site, which is on the verge of extinction today. Moreover, they justify the idea that the tangible and intangible heritage of the institute should be understood and should be handled with an integrated conservation approach.

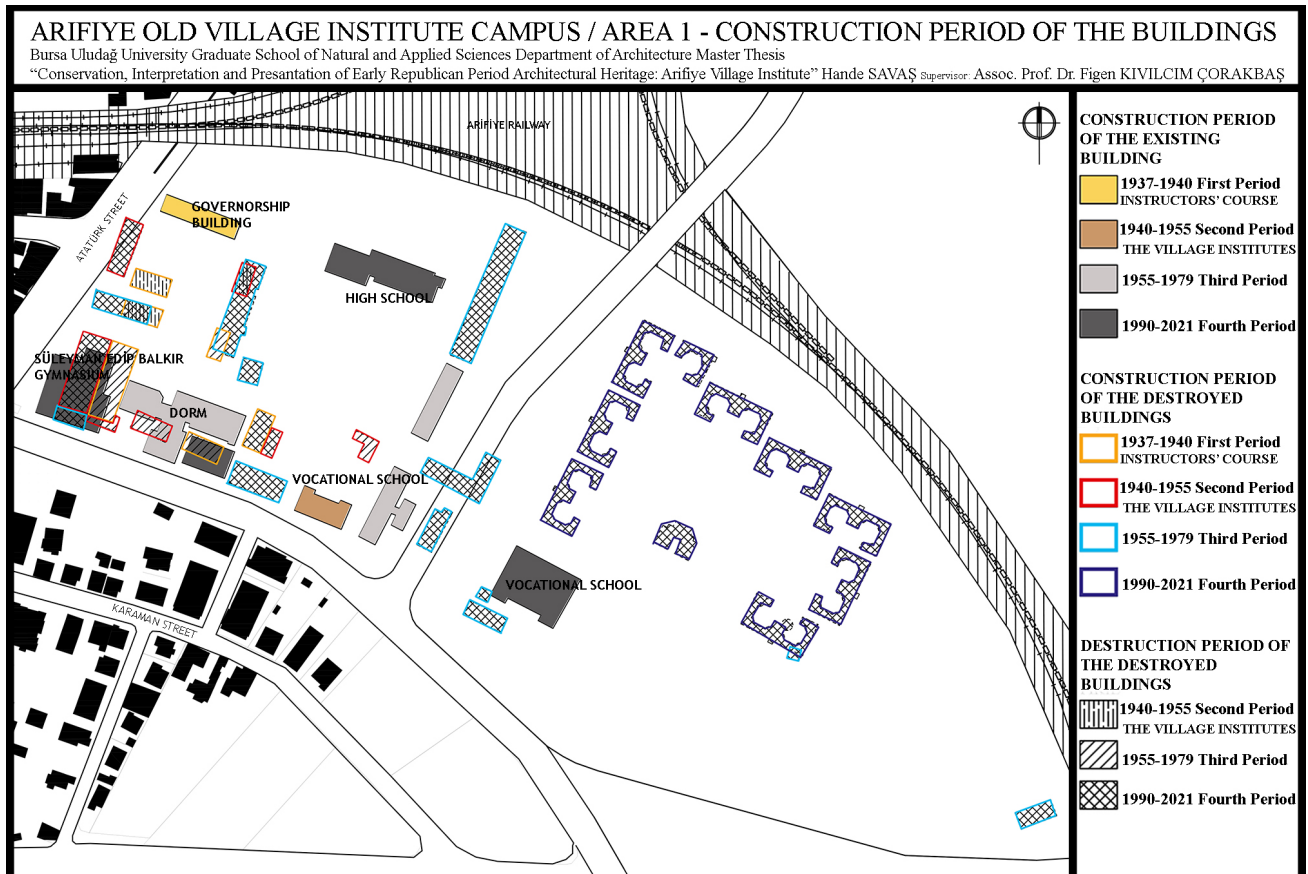
The Deterioration of the Integrity of the Arifiye Village Institute Campus

The Arifiye Village Institute was spread out across five different locations. The spatial productions developed within these areas were used for a certain period after the institute's closure, but the majority were destroyed after a while. The boundaries of the Arifiye Village Institute campus also narrowed over time, a stark change from the expansion during the institute period. Therefore, the Arifiye Village Institute campus is an example of a heritage site that could not maintain its integrity in the years since its construction. The spatial transformation over time in Arifiye Village Institute was revealed as a result of the analysis and comparison of old

aerial photographs and current photographs. The conclusions derived were crosschecked and supported by various written sources from the institute and oral interviews. This spatial transformation, which has evolved and changed over time on the campus, has been examined in four different periods (Savaş, 2021). The instructor course area (Area 1) and the competition project area (Area 2) were evaluated by mapping. The Instructor Course period lasted from 1937–1940, and the following Village Institute period spanned from 1940–1955. In the third period (1955–1979), educational functions continued throughout the campus using the institute buildings and newly constructed buildings together, and the fourth period (1990–2020) is when the settlement’s integrity was damaged due to urban planning decisions. Aerial photographs between 1979 and 1990 could not be obtained, so this article does not discuss this period.

Seven buildings were built in the instructor course area (Figure 13) during the first period. After 1940, when it officially became a Village Institute, nine other buildings were built in this area. During the Village Institute period, workshops, classrooms, a dining hall, a kitchen, and dormitory buildings were constructed. Additionally, approximately forty acres of land to the east were used as apple orchards for agricultural training (Balkir, 1974; Aydoğın, 2019). From old aerial photographs, it is understood that fifteen buildings were built between 1955 and 1979. These buildings were related to the existing institute buildings and used for educational purposes. During this period, the entire area was used for educational function (Sakarya, 2020; Aydoğın, 2020). In the fourth period, five buildings were built in this area. In the early 1990s, Necmettin Erbakan

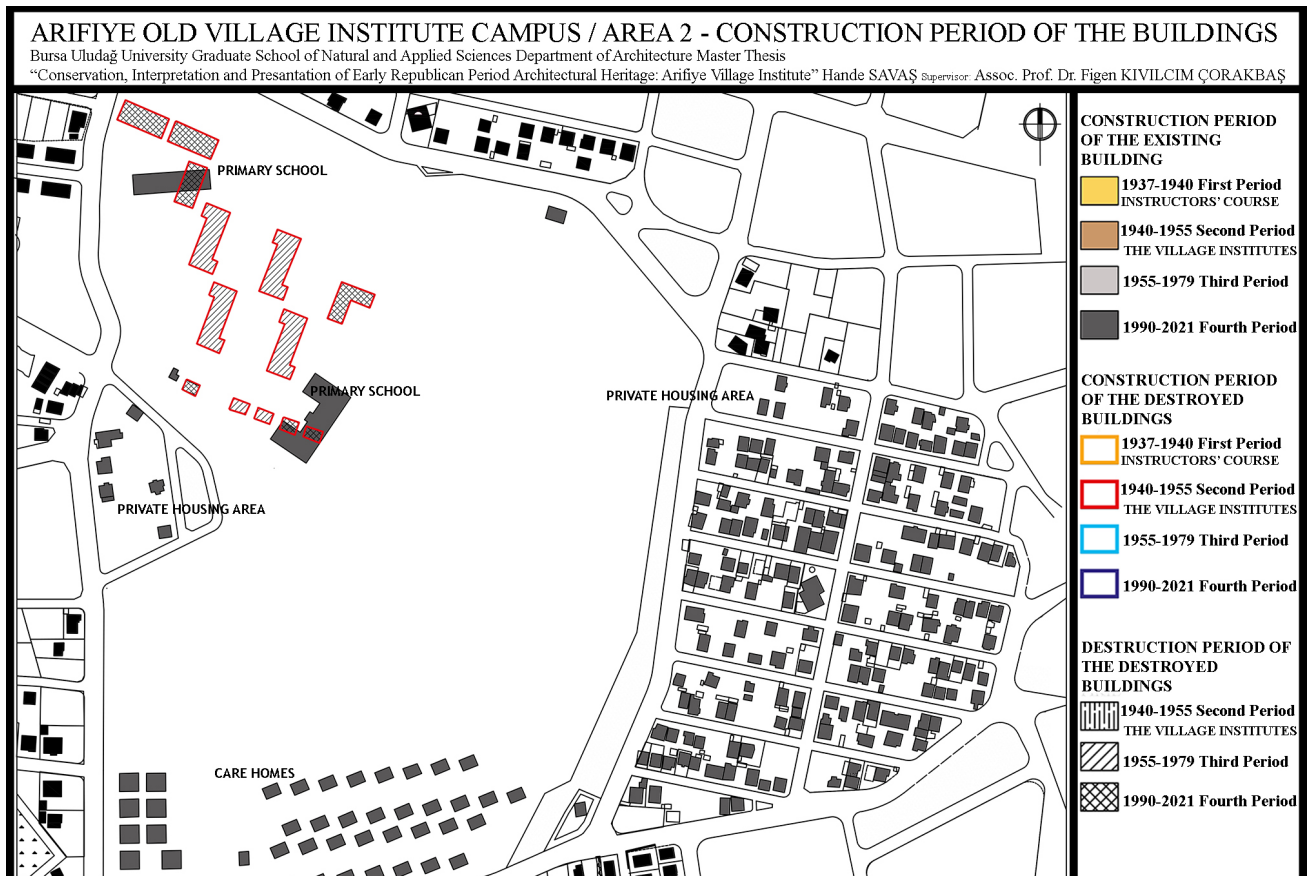
Figure 14. Mapping of the different periods in the instructor course area (Area 1) (Savaş, 2021)



Science High School, the building used as an annex to the dormitory building, ten buildings constructed after the 1999 Gölcük earthquake, one educational building, and a gymnasium named after Süleyman Edip Balkır, the founding director of Arifiye Village Institute, were built. In the following periods, larger buildings were built in this campus area, and many original institute structures quickly disappeared. Additionally, a cafeteria building from the Village Institute period was highly damaged and subsequently demolished in the 1967 earthquake (Aydoğan, 2019). In the past few decades, the instructor course area, which is in the center of the Arifiye district, has been directly affected by urban planning decisions. As a result of the expansion of Atatürk Street, which is on the western border of the area, the boundaries of the institute campus have narrowed. In 2014, the connecting road divided the instructor course area in two, although the road is not used today. After the 2000s, this area was divided into zones with different functions: education, housing, public space, a sports field, and official institutions (Figure 9). The central location of the campus areas led to substantial spatial changes due to urban sprawl. Especially after the 1970s, the areas where the institute campus is located have changed rapidly as a consequence of unplanned urbanization (Savaş and Kivılcım Çorakbaşı, 2022).

In the competition project area (Figure 15), spatial production occurred during the Village Institute period. As a result of the architectural project competition, thirteen buildings were constructed under Recai Akçay's project. In the third period (1955–1979), four school buildings and two housing buildings were demolished from the Village Institute buildings,

Figure 15. Mapping of the different periods in the competition project area (Area 2) (Savaş, 2021)



although no new buildings were built in this area. In the fourth period (1990-2021), intensive construction took place both in and around the campus area. Three work buildings, three housing units, and a bathhouse were destroyed, and the east of the area was opened for mass construction. State-owned social welfare institutions were built to the south of the area, and several private housing buildings were built to the west. Two large school buildings were built in the area where the institute housing, bathhouses, and classrooms used to stand. Today, this area is divided into many different parts with different functions, which are independent of each other.

Today, only a few physical traces of the institute can be read on the former Arifiye Village Institute campus. This situation started with the disposal of some of the five-campus areas of Arifiye Village Institute after the closure of the Village Institutes and continued with the narrowing of the boundaries of the trainer course area and the area where the competition project is located. The fragmentation of the campus areas with different functions occurred and successively, the demolition of existing structures and rapid construction took place. As a result, the institute's areas were diminished and fragmented due to urban and transportation planning decisions, highway connections, street widening, the need for housing due to the increasing population, and the 1999 earthquake.

Today, there are only two buildings from the Village Institute Period: the first one is the district governor's office building, and the second one is an education building that has lost its originality. The former was registered as cultural heritage in line with the conservation decisions taken in 2000, while the latter was not registered. The fact that the conservation decision was taken for a single building reveals that the heritage of the Village Institute campus is not handled with an integrated conservation approach. Unplanned construction and demolition activities in campus areas over the years are the most damaging causes of the loss of the physical integrity of the Arifiye Village Institute. Only one of the Village Institute campuses -the one where the district governor's office building is located- continues its educational function in a limited area, though. Until the 1990s, the campus carried out its educational function in most of the area and using existing structures. However, the new buildings built are quite far from the architectural approach of the institutes. The cluster system, which prioritizes establishing a relationship with the place, proximity to human scale, and the unity of education-daily life seen in the architecture of the institute buildings, is not seen in the buildings built in this region today. It is seen that these buildings were built with an architectural design approach that gathered all functions in a single mass. The construction of buildings with a different understanding from the architectural character of the original buildings in the institute campuses is also seen today in the Ortaklar, Çifteler, Hasanoğlan ve Pulur Village Institutes (Baysal, 2012; Kivılcım Çorakbaşı, 2014; Kivılcım Çorakbaşı and Yeşiltepe, 2015; Çetin and Kıran, 2019).

DISCUSSION

Arifiye Village Institute, as a part of the Village Institutes system, is of great significance in terms of both its establishment ideal, construction methods, and education model. Like other village institutes, it has cultural, historical, architectural, and environmental values. The fact that it is located in five different regions, provides fishing courses and hosts a recreation center

open to the use of all institutes makes the institute unique. Most of the spaces built on the campus of the institute have disappeared over time. Today, there are only very few physical traces of the campus area, whereas there are numerous intangible accounts of the Village Institute life in Arifiye.

The old Arifiye Village Institute has lost the physical integrity of its architectural and campus heritage to a great extent. Similarly, the institute's intangible cultural heritage lacks integrity. For instance, locals believe that only one of the two buildings on the campus belongs to the institute. The information that the other building belonged to the institute period was documented by overlapping old photographs and old aerial photographs by the authors. The fact that the educational equipment belonging to the institute has been exhibited for many years in the education museum helped the institute's intangible heritage go beyond its time. Being located on the campus until recent years, the Education Museum was later moved to a different school in the city center. The exhibition of the materials belonging to the institute on the campus raised awareness of the institute's existence and helped society build respect for it. The institute spirit in the memories of the graduates of the educational institutions on the campus was considered of high significance and documented by the authors. Additionally, agricultural activities in agriculture lessons and interrelating technical lessons with daily activities continued as a tradition following the Village Institute period in different educational institutions on campus. To conclude, since its establishment, the Arifiye Village Institute has made significant contributions to students as well as to society and has had a triggering role in the development and modernization of Arifiye.

Today, in the old Arifiye Village Institute campus, two buildings are known to belong to the institute period, and the trail of the road built between the institute campuses can be read. Therefore, Arifiye Village Institute is a heritage site that has lost its physical integrity. This paper argues that Arifiye Village Institute's integrity can be reestablished by restoring the integrity of its intangible cultural qualities and presenting them *in situ*. This methodology will provide an environment where the Arifiye Village Institute's heritage can be presented *in situ* with both its remaining tangible and intangible cultural heritage values. It is proposed that on this campus, which has very few tangible traces, digital methods can be used to explain and present the heritage values.

Using virtual reality (VR) and Augmented Reality (AR) systems, an experience that reflects the values of cultural heritage can be created and can be perceived by users with sound, visual, and different senses. *In situ* presentation of the heritage in the Arifiye Village Institute campus renders augmented reality (AR) systems appropriate. This system ensures that the spaces of the institute period are modeled in a digital environment and transferred to a visualization tool visually. Stories and memories can accompany the representations of the physical milieu. Visitors walking around the institute's campus can also experience the buildings and the open areas as they existed in the past by using the visualization tool in hand. It should be considered, however, that the audience may consist of many different audiences, such as visitors, local people, researchers, educators, and students, who have no connection with the heritage site.



Figure 16. The bathhouse (*hamam*) in Arifiye Village Institute – Photo collage with two photographs of the 1940s and 2018 (Area 2)



Figure 17. The road built by the village institute students between Area 1 and Area 2 – a comparative study by a photo collage of photographs from the construction period and 2020



Figure 18. Photo collage by using a photograph from the 1955-1979 period and a photograph taken in 2020 (Area 1)



Figure 19. A teachers' house - Comparative study by a photo collage that overlaps a construction period photograph and a 2020 photograph (Area 2)

CONCLUSION: AN EVALUATION OF THE INTERPRETATION AND PRESENTATION OF THE CULTURAL HERITAGE VALUES OF THE ARIFIYE VILLAGE INSTITUTE

The fact that most institute campuses continue to function as educational centers today claims the success of the place selection for the institute campuses. In the case of the Arifiye Village Institute, the educational function is sustained in one of the campus areas, although the campus boundaries were narrowed, and most of the buildings were demolished. Today, there are very few original buildings on the campus of the Arifiye Village Institute, and almost no trace of the institute can be identified physically. Oral interviews revealed that the spirit of the Village Institute is embedded in the collective memory and the personal memories of the numerous people who have come into contact with the campus over time. The exhibiting of the tools remaining from the institute in the museum and the fact that the museum has been on the institute campus for many years indicates the existence of a certain level of conservation awareness. It is significant to maintain various educational activities and institute traditions in different educational institutions on the institute campus over time.

The conservation is, therefore, problematic: the Arifiye Village Institute needs an integrated conservation approach for its tangible and intangible cultural values, as well as a clear and understandable explanation and presentation of its heritage for visitors. In this respect, using *in situ* digital presentation methods is a good opportunity to reestablish links between the tangible and the intangible aspects of the Arifiye Village Institute's legacy. This article discusses that using digital methods is a convenient and better way to present a heritage site that has lost its integrity; this approach is helpful for studying and conserving the tangible and intangible cultural heritage of the Arifiye Village Institute. The spatial transformation of the institute was represented in the 2D map created by overlapping the old aerial photos and evaluating old photos. The site plan drawing of the institute and the area's changing plans over time were also analyzed.

The study created a visual presentation method by digitally overlapping old photographs of the institute campus and current photographs. Here, the aim is to create an impression of the institute's daily life and buildings on the institute campus, which have lost their physical integrity. In addition, by using Virtual Reality (VR) and Augmented Reality (AR)

systems, further visual and auditory, experiences restoring the intangible integrity of the Village Institute's heritage can be realized.

In addition to the benefits of sharing visual and audio presentations digitally over the internet, it would be beneficial to use digital presentation techniques for interpreting the architecture and history at the site itself. Digital presentations and research techniques at heritage sites that have lost their integrity provide an essential base for future discussions on integrated conservation and the presentation of tangible and intangible aspects of lost heritage. Using *in situ* digital presentation methods to restore intangible integrity in heritage areas that have lost their tangible integrity is considered a very effective method for conveying the significance of heritage sites.

ACKNOWLEDGEMENTS

We would like to thank Karabey Aydoğan and Kemal Kocabaş for sharing photos and related documents of the Arifiye Village Institute from their personal archives. We thank Lauren Davis for her thorough copyediting.

REFERENCES

- ALADAĞ, A. (2019) *Conversation of Village Institutes as A Heritage Of Early Republican Period: İvriz Village Institute*, unpublished Master's Thesis, Department of Architecture, Middle East Technical University, Ankara.
- ALTUNYA, N. (2012) *Köy Enstitüsü Sistemine Genel Bir Bakış, Düşünen Tohum Konuşan Toprak Cumhuriyet'in Köy Enstitüleri 1940-1954 Cilt 1*, Ed. E. Işın, İstanbul, Suna ve İnan Kıraç Vakfı İstanbul Araştırmaları Enstitüsü Yayınları, İstanbul; 83-108.
- ALTUNYA, N. (2020) *Türkiye'de Eğitimin Son 100 Yılı*, Eğitim İş Yayınları, Ankara.
- ANONİM (1940) *Tebliğler Dergisi*, (70) 199-203.
- ARİFİYE KAAYMAKAMLIĞI (2020) *Hükümet Konağı Tarihçesi*, [<http://www.arifiye.gov.tr/tarihce>] Erişim Tarihi: (29.06.2020).
- ASLANOĞLU, İ. (2001) *Erken Cumhuriyet Dönemi Mimarlığı 1923-1938*. ODTÜ Mimarlık Fakültesi Yayınları, Ankara.
- AYDOĞAN, K. (2015) *Arifiye Köy Eğitimcileri Tarihi*, Demkar Yayınevi, İstanbul.
- AYDOĞAN, K. (2019) *Uygarlığın Tuğlası Arifiye Köy Enstitüsü*, Türkiye İş Bankası Yayınları, İstanbul.
- AYDOĞAN, K. (2020) Interview (Interview dates: 07.05.2020-15.01.2021).
- AYGÜN, G. (2020) Interview (Interview dates: 06.04.2020 and 29.12.2020).
- BALKIR, S.E. (1974) *Dipten Gelen Ses Arifiye Köy Enstitüsü 1940-1946*, Hür Yayınevi, İstanbul.
- BAYSAL, E. (2006) *Erken Cumhuriyet Döneminde Köy Mekânına Bakış ve Köy Enstitülerinde Mekânsal Deneyimler*, unpublished Master's Thesis, Fen Bilimleri Enstitüsü, Gazi Üniversitesi, Ankara.
- BAYSAL, E. (2012) *Köy Enstitülerinde Mekân Kurgusu ve Mimari Yapılanma, Düşünen Tohum Konuşan Toprak Cumhuriyet'in Köy*

Enstitüleri 1940-1954 Cilt 1, Ed. E. Işın, Suna ve İnan Kıraç Vakfı
İstanbul Araştırmaları Enstitüsü Yayınları, İstanbul; 136-159.

- BİL, B. (2020) Interview. (Dates of interviews: 1.04.2020 and 11.12.2020).
- BLAKE, W.H. (2010) What is the Future of Metric Heritage Documentation and Its Skills?, *Internatioanl Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol. XXXVIII, Part 5
Commission V Symposium, New Castle Upon Tyne, UK.
- BOZDOĞAN, S. (2002) *Modernizm ve Ulusun İnşası Erken Cumhuriyet Dönemi Türkiye'si'nde Mimari Kültür*, Metis Yayınları, İstanbul.
- BURSA KTVKK (2000) T.C. Kültür ve Turizm Bakanlığı Bursa Kültür ve Tabiat Varlıklarını Koruma Kurulu 16.11.2000 tarihli karar, Bursa.
- CAN BİLGE, N.A. (2017) *Paul Bonatz'ın Türkiye Yılları*, unpublished Ph.D. Dissertation, İstanbul Teknik Üniversitesi, İstanbul.
- ÇETİN, S., KAHYA, A., (2017). Village Institutes as Modernization Projects in Rural Areas: A New Interpretative Study of The Aksu and Gönen Village Institutes. *METU Journal of the Faculty of Architecture*, 34(1) 133-62.
- ÇETİN, S., KIRAN, G. (2019) Ortaklar Köy Enstitüsünde Modern Mimarlığın İzleri, *Rating Academy Journal of Arts* 2(3) 169-80.
- ÇETİNER, K.F. (2010) *Tonguç'un Mimari Mirası: Devrimci Eğitim Mimarisi, Aramızdan Ayrılışının 50. Yıldönümünde İsmail Hakkı Tonguç ve Okul Öncesinden Yüksek Öğretime Eğitim Sorunları, Çözüm Önerileri*, Yeni Kuşak Köy Enstitülüler Derneği Yayınları, İzmir.
- ÇİLİNGİR, B. (2000) *Cumhuriyet Dönemi Proje Yarışmalarında Değerlendirme Kriterleri ve Gelişimi Çalışma Alanı: Kamu Yönetim Binaları*, unpublished Master's Thesis, İTÜ, İstanbul.
- DEACON, H., DONDOLO, L., MRUBATA, M., PROSALENDIS, S. (2004) *The Subtle Power of Intangible Heritage: Legal and Financial Instruments for Safeguarding Intangible Heritage*, Cape Town: HSRC Press.
- ELDEM, S.H. (1934) Yalova'da Bir Otel Proje Müsabakası, *Mimar*, (40) 105-16.
- ERASLAN, Ş. (2020) Dünya Miras Alanlarında Özgünlük ve Bütünlük Üzerine Bir Değerlendirme: Göbeklitepe Arkeolojik Alanı ve Alanya Tarihi Kenti Örnekleri, *Sanat Dergisi*, (36) 51-62.
- FAN, J. (2018) Digital Design and Application Strategy of Intangible Cultural Heritage, *Proceedings of the 2018 International Conference on Management and Education, Humanities and Social Sciences (MEHSS 2018)*, 279-283
- GÜLEÇ KORUMAZ, A., DÜLGERLER, O.N., YAKAR, M. (2011) Kültürel Mirasın Belgelenmesinde Dijital Yaklaşımlar, *Selçuk Üniversitesi Mühendislik-Mimarlık Fakültesi Dergisi*, 26(3) 67-83.
- HGM ARŞİVİ (2020) Harita Genel Müdürlüğü Arşivi eski hava fotoğrafları.
- ICOMOS (1994) The Nara Document on Authenticity, ICOMOS.
- ICOMOS (2008) Interpretation and Presentation of Cultural Heritage Sites, Ename Charter, ICOMOS.

- ICOMOS (2011) The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns, and Urban Areas, Adopted by the 17th ICOMOS General Assembly on 28 November 2011.
- ICOMOS-Australia (2013) The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter), Sydney, New South Wales, Australia.
- İHSAN, B., AKÇAY, R. (1941) Yeni Şehir Oteli (Ankara), *Arkitekt*, (124) 53-56.
- JOKILEHTO, J. (2006) Considerations on Authenticity and Integrity in World Heritage Context, *City & Time*, 2(1) 1.
- JONES, S. (2010) Negotiating Authentic Objects and Authentic Selves: Beyond the Deconstruction of Authenticity, *Journal of Material Culture*, 15(2) 181–203.
- KAUFMAN, N. (2013). Putting Intangible Heritage in its place(s): proposals for policy and practice, *International Journal of Intangible Heritage* (8) 19-36.
- KAYA, Y. (2001) *Bozkırdan Doğan Uygarlık Köy Enstitüleri 1: Antigone'den Mızraklı İlmihale*, Tıglat Matbaacılık, İstanbul.
- KESKİN, Y. (2012) Köy Enstitüleri İçin Açılan Mimari Proje Yarışması ve Sonrası, *Düşünen Tohum Konuşan Toprak Cumhuriyet'in Köy Enstitüleri 1940-1954 Cilt 1*, Ed. E. Işın, Suna ve İnan Kıraç Vakfı İstanbul Araştırmaları Enstitüsü Yayınları, İstanbul, 110-136.
- KIVILCIM ÇORAKBAŞ, F. (2013) Hasanoğlan Köy Enstitüsü ve Yüksek Köy Enstitüsü Yerleşkesinin Mekânsal Tarihi, Mimari Değerleri ve Korunması, *Hasanoğlan Köy Enstitüsü 70 Yaşında*, Ed. K. Kocabaş, Yeni Kuşak Köy Enstitüleri Derneği Yayınları, İzmir, 322-36.
- KIVILCIM ÇORAKBAŞ, F. (2014) Mimari Koruma Perspektifinden Ortaklar Köy Enstitüsü Yerleşkesi ve Mualla Eyüboğlu, *Ortaklar Köy Enstitüsü 70 Yaşında*, Ed. K. Kocabaş, Yeni Kuşak Köy Enstitüleri Derneği Yayınları, İzmir, 105-16.
- KIVILCIM ÇORAKBAŞ, F., SÜMERTAŞ, F.M. (2014) Cumhuriyet Dönemi Mimarlığı Çifteler Köy Enstitüsü Yerleşkelerinin Mekânsal Süreklilik ve Dönüşümü, *Mimarlık*, (380).
- KIVILCIM ÇORAKBAŞ, F., YEŞİLTEPE, A.D. (2016) Köy Enstitüleri, Bauhaus ve Eğitim Mekanı, *Eğitim Reformu İçin Arayışlar*, Ed. K. Kocabaş, Yeni Kuşak Köy Enstitüleri Derneği Yayınları, İzmir, 123-38.
- KIVILCIM ÇORAKBAŞ, F., ATALAY, B. (2017) Beşikdüzü Köy Enstitüsü Yerleşkesi: Mekânsal Hafızanın Yıkımı, *Tanıklıklarla Beşikdüzü Aydınlığı*, Ed. K. Kocabaş, Yeni Kuşak Köy Enstitüleri Derneği Yayınları, İzmir, 113-29.
- KIVILCIM ÇORAKBAŞ, F., KUNT, Z., ACAR BİLGİN, E. (2018) *Kitapçık 5: Kentsel Mirasın Somut Olmayan Kültürel Niteliklerini Anlamak ve Belgelemek*, İstanbul'un Dünya Miras Alanlarını Çoklu Perspektiften Yorumlamak: İstanbul Kara Surları Örneği, Araştırma projesi, TÜBİTAK Katip Çelebi ve AHRC Newton fonu işbirliği.
- KIVILCIM ÇORAKBAŞ, F. (2020) "Yeni Bir Köy" ve Mimarları: Malatya Akçadağ Köy Enstitüsü ve Ahsen Yapanar ile Asım Mutlu,

Tanıklıklarla Köy Enstitüsünden İlköğretmen Okuluna Akçadağ Aydınlığı,
Ed. K. Kocabaş, Yeni Kuşak Köy Enstitüleri Derneği Yayınları,
İzmir, 78-96.

- KIRBY, F. (2019) [1962] *Türkiye’de Köy Enstitüleri*, Trans. Niyazi Berkes, İstanbul: arihçi Kitabevi.
- KÖKSAL, A. (2020) Interview. (Interview date: 06.04.2020).
- MENDERES, A. (1968) “Recai Akçay’ın Ölümü”, *Arkitekt*, (329) 32.
- MUNJERI, D. (2004) Tangible and Intangible Heritage: from difference to convergence, *Museum International*, (56) 12–20.
- PARENT, M. (1979). Item 6 of the Provisional Agenda. Comparative Study of Nominations and Criteria for World Cultural Heritage, third session of the World Heritage Committee (23–27 October), CC-79/CONF.003/11 Paris: UNESCO.
- REMONDINO, F., RIZZI, A. (2010) Reality-Based 3D Documentation of World Heritage Sites: Methodologies, Problems and Examples, *Applied Geomatics* 2(3): 85-100.
- SAKARYA, Y.A. (2020) Interview. (Interview date: 25.05.2020 – 29.12.2020).
- SAVAŞ, H., KIVILCIM ÇORAKBAŞ, F. (2022) Construction and Destruction of the “Rural” Morphology of the Village Institutes: The Case of Arifiye, *2nd Regional Conference of Cyprus Network for Urban Morphology Transformation and Conservation of Urban Form in South-Eastern Mediterranean Cities*, 7-9 April 2022, Famagusta – Cyprus.
- STOVEL, H. (2008) “Origins and Influence of Nara Document on Authenticity,” *APT Bulletin* 39, (2/3) 9-17.
- ŞİMŞEK, G., MERCANOĞLU, C. (2018) Bir “Planlama Örneği” Olarak Köy Enstitüleri Deneyimi, *Planlama Dergisi*, 28(3) 261-81.
- TÜRKOĞLU, P. (2019) [2000] *Tonguç ve Enstitüleri*, Türkiye İş Bankası Kültür Yayınları, İstanbul.
- T.C. MAARİF VEKİLLİĞİ (1940) Köy Enstitüleri Binalarının Avan Projelerine Aid Müsabaka Şartnamesi, Devlet Matbaası, Ankara.
- T.C. RESMİ GAZETE (1940) Köy Enstitüleri Kanunu, 22.04.1940 tarihli T.C. Resmi Gazete (4491) 13682.
- THYSSEN, G., PRIEM, K. (2013) Mobilizing meaning: multimodality, translocation, technology and heritage, *Paedagogica Historica*, 49(6) 735-44.
- TONGUÇ, E. (2012) Bir Eğitim Devrimcisi: İsmail Hakkı Tonguç, *Düşünen Tohum Konuşan Toprak Cumhuriyet’in Köy Enstitüleri 1940-1954 Cilt 1*, Ed. E. Işın, Suna ve İnan Kıraç Vakfı İstanbul Araştırmaları Enstitüsü Yayınları, İstanbul; 38-59.
- TÖRE, T. (2010) Sanal Gerçeklik ve Mimari Koruma (Anlatım ve Sunum Bağlamında Bir Değerlendirme), unpublished Master’s Thesis, MSGÜ, İstanbul.
- UNESCO (2002) Operational Guidelines for the Implementation of the World Heritage Convention, UNESCO Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, World Heritage Center.

- UNESCO (2003) *The Convention for the Safeguarding of the Intangible Cultural Heritage* [https://ich.unesco.org/en/convention] Access Date (12.06.2023).
- UNESCO (2005) Operational Guidelines for the Implementation of the World Heritage Convention, UNESCO Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, World Heritage Center.
- UNESCO (2021) Operational Guidelines for the Implementation of the World Heritage Convention, UNESCO Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, World Heritage Center.
- VECCO, M. (2010) A definition of cultural heritage: From the tangible to the intangible, *Journal of Cultural Heritage*, (11) 321–4.
- VIT-SUZAN, I. (2014) *Architectural Heritage Revisited: A Holistic Engagement of its Tangible and Intangible Constituents*. Ashgate, Farnham.
- WANG, Z. (2006) *Integrity in Focus: A New Media Strategy for Vanishing Cultural Heritage*. [https://www.comitedufilmethnographique.com/zilan-wang/] Access Date (12.06.2023).

Alındı: 07.02.2022; Son Metin: 26.05.2023

Anahtar Sözcükler: Arifiye Köy Enstitüsü; Erken Cumhuriyet Dönemi; bütünlük koruma yaklaşımı; yerinde dijital sunum teknikleri; kültürel mirasın sunumu ve yorumu.

BÜTÜNLÜĞÜNÜ KAYBETMİŞ MİRAS ALANLARINI ANLAMAK, YORUMLAMAK VE SUNMAK: ESKİ ARİFİYE KÖY ENSTİTÜSÜ YERLEŞKESİ ÖRNEĞİ

Kültürel ve doğal miras alanlarının bütünlük niteliğini taşıması, özellikle UNESCO Dünya Miras çalışmaları bağlamında önemli kabul edilmektedir. Bütünlük, doğal veya kültürel mirasın fiziksel özniteliklerinin eksiksizliğinin bir ölçütüdür. Öte yandan, kültürel anlam ve önem sadece mirasın somut yönlerinde değil, aynı zamanda mirasın toplumsal hafıza, anlamlar, anılar gibi somut olmayan yönlerinde somutlaşır. Önemli miras değerlerine sahip çok sayıda miras alanının bütünlük kriterini karşılayamadığı göz önüne alındığında, bu makale, “bütünlükten” yoksun miras alanlarının, somut ve somut olmayan kültürel niteliklerinin entegre bir değerlendirmesi ve yerinde sunumu yoluyla miras değerlerinin kısmen yeniden kazanabileceğini ve canlandırabileceğini savunmaktadır. Benzer şekilde, yerinde sunum teknikleriyle bütünlüğün restorasyonu sağlanarak miras alanlarının mimari, kültürel ve tarihi değerlerinin takdir edilmesi teşvik edilebilir.

Bu çalışma kapsamında, bütünlüğünü kaybetmiş bir miras alanı olan eski Arifiye Köy Enstitüsü yerleşkesinin somut ve somut olmayan kültürel nitelikleri bütünlük olarak çalışılmış ve bu yerleşkenin değerlerinin dijital teknolojiler ile yorumu ve sunumu tartışılmıştır. Köy Enstitüleri, Cumhuriyet Dönemi'nin modernleşme ve yeni bir kimlik inşasını kırsal alanda gerçekleştirmek amacıyla yurdun 21 farklı noktasında konumlandırılmıştır. Birbirleriyle bağlantılı bir ağ sistemi olarak mekânsal üretim gerçekleştiren ve ülkede eğitim birliği sağlayan bu ağın bir parçası olarak Arifiye Köy Enstitüsü, 1940 yılında Kocaeli'nde kurulmuştur. Arifiye Köy Enstitüsünün eğitim ve mekânsal tarihi 1937 yılında kurulan

Arifiye Eğitim Kursuna dayanmaktadır. 1940 yılında 12 adet Köy Enstitüsü için açılan Köy Enstitüleri ulusal mimari proje yarışmasında Arifiye Köy Enstitüsü yerleşkesinin proje yarışmasını yüksek mimar Recai Akçay kazanmıştır. Arifiye Köy Enstitüsünde Eğitim Kursuna ait mekânlar ve yarışma projesi sonucu üretilen mekânların dışında farklı alanlarda eğitim amacıyla gerçekleşen eylemler sonucunda mekânsal üretimler gerçekleşmiştir. Bu durum, birçok farklı alanda yerleşim gösteren Arifiye Köy Enstitüsünü diğer enstitü yerleşkelerinden ayıran özgün bir özelliktir. Arifiye Köy Enstitüsü, kurulduğu günden günümüze dek eğitim yerleşkesi olma özelliğini sürdürmesine rağmen özgün yapılarının büyük bir çoğunluğu kaybedilmiştir. 2000 yılında alınan tescil kararı sonucunda yerleşkede bulunan tek bir yapının tescillenmesi koruma kararlarının bütüncül bir yaklaşım ile ele alınmadığının bir kanıtı niteliğindedir. Zaman içerisinde değişen eğitim sistemlerine paralel olarak geçirdiği değişimler de yerleşkenin mekânsal özelliklerini dönüştürmüştür. Mevcut yapıların işlevsel değişiklikleri, bütüncül olmayan koruma yaklaşımı, yıkım kararları ve yerleşke içerisine farklı karakterde mimari yapıların eklenmesi yerleşkenin bütünlüğünü zedelemiştir. Mimari, tarihi, politik ve eğitsel değerlere sahip olan Arifiye Köy Enstitüsü yerleşkesi sahip olduğu somut izler ve somut olmayan kültürel miras değerleri ile bütüncül bir koruma yaklaşımı ile ele alınması gerekmektedir.

Bu çalışmada, enstitünün bütünlüğünü kaybetmiş bir miras alanı olarak korunmasında miras alanının sunumunun ve yorumunun önemi vurgulanmıştır. Arifiye Köy Enstitüsünün öneminin ve somut ve somut olmayan miras değerlerinin anlatılmasında, yorumunda ve sunumunda yöntem olarak dijital sunum tekniklerinin kullanılması, somut bir iz bulunmayan miras alanlarının korunmasında etkili bir yaklaşım olarak ele alınmıştır.

UNDERSTANDING, INTERPRETING AND PRESENTING HERITAGE SITES THAT LACK INTEGRITY: THE CASE OF THE OLD ARİFİYE VILLAGE INSTITUTE CAMPUS (1)

One of UNESCO's evaluation criteria for cultural and natural World Heritage Sites is the concept of integrity, which measures the completeness of a natural or cultural heritage site's tangible architectural, urban, and environmental qualities. On the other hand, cultural significance is not only embodied in the tangible aspects of heritage but also inherent in the intangible aspects like associations, meetings, memory, and records. Considering that numerous sites that do have significant heritage values do not meet this integrity criterion, this paper argues that heritage sites that lack "integrity" can partially regain and revive their heritage values through an integrated evaluation and on-site presentation of their tangible and intangible cultural qualities. Similarly, the restoration of integrity by the *in situ* presentation techniques can promote the appreciation of the site's architectural, cultural and historical values.

Through an integrated methodology, this study analyzes the tangible and intangible cultural qualities of the Arifiye Old Village Institute campus, a heritage site that lacks integrity. Additionally, this paper discusses the role of digital technologies in the interpretation and presentation of the values of this campus.

Village Institute campuses were situated in twenty-one different locations in Turkey; they were created to carry out modernization efforts and

facilitate the construction of modern Turkish identity in the rural areas of the new Turkish Republic. The architectural projects of fifteen of the twenty-one Village Institute campuses, including the Arifiye Village Institute, were obtained through national architectural competitions. The architectural program included ateliers, classrooms, administrative buildings, service buildings, dining halls, dormitories, sports halls and open-air sports areas, and, in some cases, music schools and facilities for fishing.

The Arifiye Village Institute was founded in Kocaeli in 1940. The educational and spatial history of the Arifiye Village Institute began with building of the Arifiye instructor course buildings in 1937. In 1940, the architect Recai Akçay was awarded first prize in the national architectural competition for his design of the Arifiye Village Institute. The construction of the buildings was considered part of the training education, and students built many of the buildings at Arifiye, including those in the instructor course area, the competition project area, and at other locations, like on the shores of nearby Sapanca Lake. The Arifiye Village Institute differs from other institute campuses, which were mostly confined to just one location.

Although the Arifiye Village Institute has been an educational campus since its establishment, most of its original buildings are now lost. As a result of a Turkish Ministry of Culture and Tourism decision in 2000, a single building on the campus was registered as cultural heritage; that is a first step but is insufficient for conserving the site as a whole. The physical changes, in parallel with the changing educational systems over time, transformed the spatial characteristics of the campus. Functional changes to the existing buildings, a non-holistic conservation approach, demolition decisions, and the addition of architectural buildings incompatible with the character of the campus damaged its integrity. The Arifiye Village Institute campus, which has architectural, historical, political, and educational values, needs to be handled with an integrated conservation approach that prioritizes its tangible remains and intangible cultural heritage values.

This article explores the importance of interpretation and on-site digital presentation for this campus and for other heritage sites that have lost their integrity. Using on-site digital presentation techniques to explain, interpret, and present the cultural significance of the Arifiye Village Institute and its tangible and intangible heritage values is an efficient and beneficial way to approach the conservation of heritage sites that have limited architectural remains.

HANDE SAVAŞ OKUMUŞ; B.Arch, M.Sc.

Completed her undergraduate degree between 2014-2018 and her master's degree between 2019-2021 at Bursa Uludağ University Faculty of Architecture. Currently a PhD student at Bursa Uludağ University. Her research interests include modern heritage, industrial heritage, conservation and restoration, architectural design approaches. handeesavas@gmail.com

FIGEN KIVILCIM ÇORAKBAŞ; B.Arch, M.Sc., PhD.

Received her bachelor's degree in architecture and MSc in restoration from Middle East Technical University (1998-2008). Earned her Ph.D. degree from Rome Sapienza University (2011). Her major research interests include site management, GIS, heritage conservation, interpretation and presentation. figenkivilcim@gmail.com

READING ANKARA APARTMENT BALCONY BALUSTRADES (1950-75) AS MATERIAL CULTURE AND THEIR DIGITAL DOCUMENTATION

Zeynep TUNA ULTAV*, Daniele SAVASTA**,
Meltem Ö. GÜREL***

Received: 03.07.2022; Final Text: 12.04.2023

Keywords: Material culture; modern architectural heritage; memory; balcony balustrades; digital documentation.

1. The research project, coded BAP086, was conducted by the authors between 03.01.2020 and 03.06.2021. Only one study of note has focused specifically on balcony balustrades, so it is worth citing here. This project was "The Balustrades of Beirut" Exhibition, organized by Mazen Haidar (PhD) in Beirut, Lebanon, to raise awareness about the city's modern balcony balustrades. See also Mazen Haidar's book about this project (Haidar, 2022). Another project worth citing here is Civilian Architectural Memory 1930-1980 (*Sivil Mimari Bellek Ankara 1930-1980*), carried out at Başkent University and supported by TÜBİTAK (Scientific and Technological Research Council of Turkey) and VEKAM (Koç University Vehbi Koç Ankara Research Application and Research Center). This extensive study examined Ankara's civil architectural cultural heritage research, documentation, and protection criteria development project between 1930 and 1980 (<http://sivilmimaribellekankara.com/>; Bayraktar, 2017).

* Corresponding Author; Yaşar University, Faculty of Architecture, Department of Interior Architecture and Environmental Design, İzmir, TÜRKİYE.

** İzmir University of Economics, Department of Visual Communication Design, İzmir, TÜRKİYE.

*** Yaşar University, Faculty of Architecture, Department of Architecture, İzmir, TÜRKİYE.

INTRODUCTION

Wrought iron, in forms of intricate front doors, fences, and balustrades, has been a significant feature of domestic building culture and decorative arts since the 19th century. Balustrades of apartment balconies, considered as craftwork, can be considered an extension of this building culture, reflecting contemporary designs of different eras. This paper focuses on apartment balcony balustrades built between 1950 and 1975 in Ankara as a noteworthy material evidence of modern Turkish architecture and sets out to demonstrate their relatively unexplored role in the preservation of Turkey's architectural heritage, and their contribution to a more extensive reading of the built environment. Wrought iron balustrades can be considered a micro representation of modern architectural heritage, therefore their preservation is arguably pertinent with respect to values linked to their roles as a part of material culture. In this sense, this study addresses three main questions: Why are they regarded as substantial elements of material culture? Why should they be preserved? How does digital documentation serve as a useful tool in the preservation processes? The examples were collected through a research project entitled "Interactive Digital Exhibits to Experience Architectural Heritage: The Case of Balcony Balustrades of Ankara (1950-1975)," which documented and digitalized the balcony balustrades of 1,850 apartment buildings built between 1950 and 1975 in Ankara's Çankaya District (**Figure 1**) (1).

Ankara has an important place in Turkey's modernization story starting with the foundation of the Republic of Turkey in 1923. During its transition from a small town to the capital of the new Republic, Ankara was the scene of various original and important planning decisions, with architectural work being produced in line with these decisions (Ulusoy, 2013). Republican modernization project involving new political, economic, social, and cultural models first came to life in Ankara. During the War of Independence, Istanbul's population decreased, whereas Ankara was

2. Günay describes Ankara as a “testing ground for the republican’s administration’s experiments to develop a new society and its city in conformity with the rules of modernism” (Günay, 2013, 12). Similarly, Bozdoğan and Akcan describe “the making of a modern capital city out of a small, poor, malaria ridden and dusty town” as an “an epic accomplishment of a new regime” where architecture acted as a powerful actor (Bozdoğan and Akcan, 2012, 26).

3. The settlements of detached/semi-detached houses can be exemplified with Tandoğan Mebusevleri Settlement, Keçiören Kalaba Mebusevleri Settlement, Kavaklıdere 14 Mayıs Housing Cooperative, Kavacık Subayevleri Cooperative, and Keçiören Merbank Houses; apartment block settlements can be exemplified with İsrailçevleri, Kütüphanevleri, Yeşiltepe-Yıldıztepe Blocks, Maliye Houses, Konservatuvar Houses, Eti Blocks, İlbank Blocks, Basın Sitesi, Eser Sitesi, İş Bank Blocks, and Dostlar Sitesi; and single multi-story apartment buildings can be exemplified with Cinnah 19 Apartment Block, 961ar Apartment Block, Hayat Apartment Block, Mintrak Apartment Block, and İpek Apartment Block (Şumnu, 2018). For further discussion of prominent housing complexes built in Ankara in 1950s and 1960s, also see Bayraktar, 2017.

4. With its 124 recent neighborhoods, the border of Çankaya district today is much broader than the time period of the study, which focused on 41 neighborhoods.

flooded with soldiers, civil service candidates, and job seekers even before it was declared as the new capital. Therefore, there was an urgent need for improvement in Ankara’s urban conditions during the establishment of the national assembly and successive military victories (Cengizkan, 2002) (2). While initially population growth was mostly due to bureaucrats arriving from Istanbul, this changed later as the masses migrated from the immediate surroundings. Ankara then experienced a serious housing problem, which brought housing and urban planning practices to the fore (Bayraktar, 2017). Among these practices, housing cooperative initiatives, starting with the Bahçelievler (houses with garden) in 1934, became more widespread following the enactment of laws encouraging housing construction in 1950s (Cengizkan, 2002). In this decade, three types of housing production attracted particular attention: detached/semi-detached houses, apartment blocks, and single multi-story apartment buildings (Cengizkan, 2000; Cengizkan, 2002) (3). In this context, Çankaya became a leading district in the construction of prominent housing examples, including the era’s emerging apartment building typology. For this reason, the study focused on Çankaya District that was densely populated during the time period of the study (4). The selection of these neighborhoods was based on their historical significance in the development of apartment building typology within the city. All streets in the district were visited and all apartment buildings with ‘simple’ balustrades in line with the architectural ideas of mid-century modernism were photographed. The following analysis narrowed the selection down to 90 balustrade designs, which were repeatedly used within the project’s geographical boundaries. Further data were gathered on these 90 balustrades through archival study.

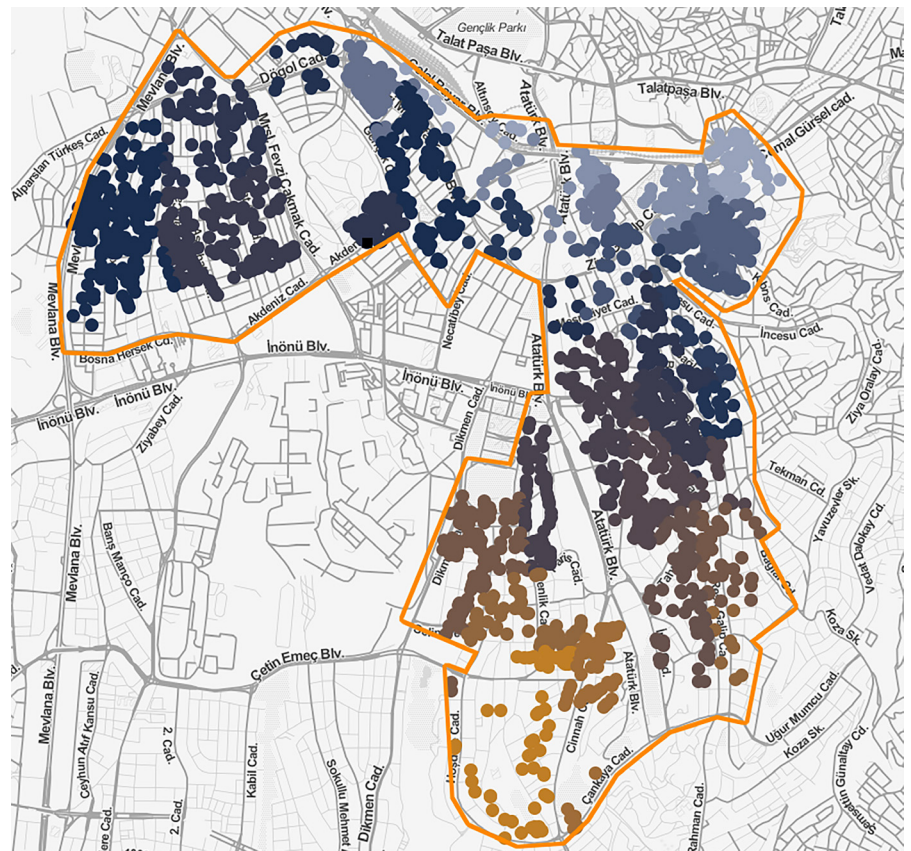


Figure 1. Map showing the research area borders in Çankaya District and the locations of the balcony balustrades of the 1,850 apartment buildings (Savasta archive)

5. İlhan Tekeli (2012) divides Turkey's housing history into four periods: 1923-1950; 1950-1965; 1965-1980; and post-1980s. When we sorted the dates with regard to our findings from the project tags of the selected apartments, we found that the selection finished in 1975. Therefore, we defined 1975 as the end of the study period.

6. As Bozdoğan (2016) states, during the early 1950s, with the advent of liberal economics and the Democrat Party's populist politics, major cities in Turkey witnessed a vast migration from the countryside, which generated an extensive need for urban housing. Among the significant developments were the establishment of Real Estate and Credit Bank to finance urban housing, and the first collective housing projects using reinforced concrete construction. Bozdoğan (2016, 17) further states that "Turkey's urban population, which grew by 20.1 percent in the decade 1940-1950, reached a growth rate of 80.2 percent between 1950 and 1960." One of the most important laws of the multi-party period was the Building Promotion Law passed in the first year of the Ministry of Building and Housing in 1958 (Sey, 1998).

7. See the article about lighting fixtures by Artemis Yagou, who reports a similar sense of delight regarding her study of lighting fixtures in modern Athens apartment buildings, describing them as "the highly expressive assertion of what it meant to be 'modern' in Athens" (Yagou, 2007).

8. As Frank Trentmann (2016) suggests, in the last few hundred years, our lives have been dominated by the achievement, flow, and use of things, namely consumption. He states that taste and lifestyle characterize our identity and the way that others see us.

The primary reason for focusing on the years 1950 to 1975 was because the documentation revealed that wrought iron balcony balustrades of the selected apartment buildings were produced during this period (5). Other reasons include changes in housing production under Democrat Party rule (1950-60), particularly the implementation of liberal economic politics, the development of the private sector, improvements in the construction industry, technology and materials, and decrease in traditional workmanship in the construction sector. Starting in the 1950s, multistory apartment buildings proliferated to become the dominant housing type in Turkish cities, mainly due to the demand for housing caused by population growth and rapid urbanization. This led to the introduction of the Flat Ownership Law in 1965, which encouraged a build-sell model in which the contractor was a key actor who aimed to maximize profits and significantly rationalize the design approach. As Mübeccel Kıray pointed out, apartments facilitated the development of the middle classes by providing affordable housing options with modern amenities. Initially, apartment buildings in Ankara were constructed to house politicians, government staff, military personnel, bureaucrats, and foreign embassy personnel. During the 1950s, the city remained a significant urban hub of apartment production even though modernization initiatives in architecture and urbanism shifted from Ankara to Istanbul under the Democrat Party's modernization policies (6). As part of this production, wrought iron balcony balustrades were commonly used as tools to dress the rational façades of apartment buildings. Although they also appeared in other cities, the documentation indicates that they were used more frequently in modest Ankara apartment buildings, showcasing a wide range of designs.

More recently, these balustrades are disappearing due to urban renewal initiatives based on government policies, and the ongoing practice of replacing older buildings with more profitable newer ones. Meanwhile, the surviving balustrades on the older buildings remain as decorative gestures that please the eye of passers-by while simultaneously representing the modernist design language within Ankara's architectural repertory (7).

By emphasizing their significance as mundane material evidence reflecting the city's historical construction practices and present visual character, the study advocates for the documentation of these elements. It contends that digital documentation, conducted as part of the research project, plays a crucial role in preserving their memory, particularly when faced with the imminent risk of demolition. This documentation enables an alternative interpretation of the city and safeguards its cultural heritage. The approach of the study is based on the belief that material qualities of balcony balustrades have the potential to enrich the understanding of the built environment beyond the mainstream architectural histories of the city. As Reyner Banham puts it, "architectural historians spent too much time looking at canonic works," rather than at "the everyday and the ordinary" (Banham, 1970, as cited in Forty, 2014). Mundane buildings of domestic architecture, such as apartment buildings, and their material components also deserve in-depth studies as social objects conveying information about the society. Furthermore, their documentation is pertinent because they are more vulnerable to rapid transformation or demolition. Balcony balustrades are subject to even more frequent transformation than the buildings themselves, consumed and revised according to their owners' changing tastes or lifestyles (8).



Figure 2. Samples from the digitally documented apartment buildings of the research project (Tuna Ultav archive)

The most obvious cultural belief associated with material objects relates to value (Prown, 1982). It is essential to document and preserve these balustrades for their multifaceted significance. Firstly, they hold document value, offering insights into the social, economic, and cultural aspects of society within that space. Secondly, they possess architectural value, serving as representations of the modernist architectural ideology of that era (9). Document and architectural values both refer to concrete indicators of the understandings, needs, and relations of the period when the balcony balustrades appeared. Departing from the balustrades' representative and communicative roles inherent in document and architectural values, this study argues for their preservation on three main grounds: the authenticity aspect, the technological aspect, and their role in tracing the relationships among various actors of the construction processes.

The studied 1,850 apartment buildings, typical of the local apartment building typology, were multistory prismatic structures with standard attributes (Figure 2). Rather than their architectural traits, the selection depended on the formal qualities and modern character of the balcony balustrades (Figure 3). Physically and conceptually distant from traditional architectural practices in Turkey, they displayed a playful but at the same

9. For a detailed discussion, see Madran (2006).



Figure 3. Samples from the digitally documented balustrades of the research project (Tuna Ultav archive)

time, abstract visuality typical of modern architecture. The analysis of balcony balustrades is reinforced by a combination of literature review and interviews. This approach allows for a broader understanding of the subject matter. Specifically, the study conducted interviews with three architects and six craftsmen who worked during that period. Additionally, interviews were carried out with three metalwork scholars or teachers, along with an architectural history scholar who conducted a parallel project in Beirut. These interviews, along with the photographs taken during the fieldwork, are used to explore the tripartite aspects defined above.

BALCONY BALUSTRADES AS MATERIAL CULTURE

Historians filter what they see in the past before re-presenting them based on their understanding of what is or is not important. Henry Glassie (1996) proposes that history begins with the will of the historian and speaking myths. The historian, he adds, dares to ignore most people or events, and selects and arranges a small number of facts to speak about humanity. In this view, history emerges as an archeological medium in which cultural materials accumulate, establish patterns, and provide context for writing. Culture is seen as a mental concept constructed by people with shifting experience. People agree on the importance of certain issues and link their futures through “compatible understandings,” thereby creating a culture (Glassie, 1996).

Material culture refers to the physical objects created by people (Ferguson, 1977) (10). This is fed by a transdisciplinary approach, analyzing not only different artifacts, but also the complex relationships between them and the societies in which they are situated (Saunders, 2017). Since people interact with material goods or objects as part of their daily lives, one can suggest that their living is greatly influenced by material culture. In other words, by studying these objects, one can deduce the value systems including “ideas, attitudes, and assumptions” of a specific society and generally during a specific time (Schlereth, 1982). Objects, as expressions of cultural identities, enable material culture studies to access a culture, and thus, understand its cultural code and social relationships through the objects’ materiality (Vellinga, 2007). Therefore, material culture, being the object-based characteristic of the study of culture refers both to the material, as the study’s subject, and to the understanding of culture, as its purpose.

Jules David Prown suggests that the word “material” in material culture incorporates objects as artifacts, objects created or adapted by people, but excludes natural objects. Thus, he proposes that material culture studies should include objects from different scales: a hammer, a plow, a microscope, a painting, a house or even a city (Prown, 1982). Accordingly, architecture can be considered as part of material culture: from the scale of an entire building to the smallest elements that constitute it. Architecture, being established in context, is seen as the most noteworthy element of material culture in archeology and anthropology (Bailey and McFadyen, 2010). As John Goss notes, a building is a material culture object constructed by a society and reflects its social relations as well as the progress level (Goss, 1988). In this respect, in addition to its physical attributes, a building can be considered as a cultural artifact, whose components belong to a wider material culture of a society. Similarly, Daniel Miller states that besides reflecting culture, buildings are an element in the reproduction of social relations through communicating social

10. Materials include “raw materials, technology, tools, techniques as well as the finished products” (Chilton, 1999, 1). The term “material culture” was first coined in 1843 by Prescott “in reference to the material civilization of Mexico in his travelogue.” By the end of the 19th century, it was inextricable from the discipline of anthropology (Buchli, 2002). Daniel Miller (2010) states that at the time that material culture studies had an extremely low status within anthropology, objects hid their roles, assuming no importance.

11. The balcony section of the exhibition displayed several forms of balconies, such as “political balcony, social balcony, consumed balcony, filled in balcony, overstuffed balcony, micropolitical balcony, green balcony, etc.” The balcony was described as sharing “ancestry with the veranda, terrace, loggia, or ‘street in the sky’” yet unique among them owing to its cellularity and cantilever (*Balcony*, 2014, 816).

meanings (Miller, 2010). Along this line of thought, İlhan Tekeli (1996) focuses on the close relationship between dwellings and socialization, acknowledging the identity of social development stages and residential history stages. Uğur Tanyeli (2004) asserts that modern people cannot exist together without objects and spaces, and that acquiring and stacking artifacts and images in certain places and areas is a basic function in making people, humans. Such concepts are likely to be valid for façade design, such as decorating residential exteriors with images. As Anuradha Chatterjee (2014, 11) suggests, “surface is both superficial and pervasive, symbol and space; meaningful and functional; static and transitory, object and envelope ... despite the disciplinary definition of architecture as space, structure, and function.” The balcony, as such a surface, is an important element of an apartment building’s façade. It can be described as “both a prime site of aesthetic and technical experimentation and a heavily charged articulator of the dependencies that exist between the public and private realms” (BK at the Biennale: Anatomy of a Balcony, 2014). In the catalogue of the 14th Architectural Biennale of the Venice Biennale with the theme “Fundamentals,” Rem Koolhaas (2014, 17), the main curator of the “Elements of Architecture” Exhibition, describes the exhibition as “a new body of knowledge.” The author suggests conducting a thorough examination of building elements, including floors, walls, ceilings, roofs, doors, windows, facades, balconies, corridors, fireplaces, toilets, stairs, escalators, and ramps. These commonly overlooked yet universally familiar architectural components hold the potential to unveil unexpected histories and narratives (11). Moreover, as Carolin Aronis reveals, these architectural components constitute places in which urban public and private areas meet, creating potential meanings as elements of “urban liminal architecture” (Aronis, 2022, 475).

John Ruskin’s theory of the adorned wall veil proposed that “good architecture evoked the image of a well-dressed body,” and led to the redefining of architecture as “an entirely visual phenomenon” – as a surface (Chatterjee, 2014, 2). In this respect, balustrades add to the aesthetics of the building through the conception of the façade as adorned veil (Davidovici, 2004). During the 19th century, Gottfried Semper, Karl Friedrich Schinkel, and Louis Sullivan discussed the notion of architectural ornament as a necessary supplement (Picon, 2013). However, 20th century modernist art and design appeared to turn its back on craft, rendering the traditional craftsman extinct in the modernized world. Struggling to survive in the shadow of modernism, ornament’s success depended purely on its ability to differentiate itself from earlier styles (Trilling, 2001). While resisting the use of ornament in architecture, modernist architects developed unconventional methods of ornamentation, such as Le Corbusier’s employment of concrete formwork traces. Such approaches to ornament redefined its connections with the overall structure and proportions of the building (Picon, 2013). Despite the modernist denials, raising the question of whether ornament can bring insight into architecture, Antoine Picon (2013) argues that architectural ornament was intended not only for the purpose of pleasure but also to spontaneously stimulate spectators’ senses and trigger both recognition and surprise. According to an interview with Mehmet Savaş (2020), a practicing architect at that time, balcony balustrades evoked a sense of surprise and playfulness as they disrupted the monotonous appearance of conventional facades:

“Since the owners or the contractors wanted to get maximum benefit from zoning rights, our colleagues were in demand to enrich the monotonous

façades with balconies. In this case, balcony balustrades became important. Due to cost factors, most balustrades were initially manufactured with simple workmanship. However, in houses of over 100 square meters, balconies took on a prominent role in creating attractive façades. Owners showed their commitment to high quality of building by improving the building's façades through balcony aesthetics, guided by the taste of the architect. The popularity of a balustrade design was reflected in how often it was reproduced in other newly built apartments" (M. Savaş, personal communication, November 21, 2020).

As per Savaş's perspective, the repetition of balustrade patterns was a continuation of the architectural language in the sense that the ornament associated with the plasticity of façades established relationships with both the building and urban fabric (Balık and Allmer, 2016). Ornament is employed as an important transporter of meaning that reaches beyond the standard and direct legibility, allowing it to reference the rich architectonic language of which it is intentionally a portion (Stuhlmacher, 2004). Wrought iron balcony balustrades of different designs served as tools to aestheticize the conventional façade treatments and became the major artistic feature for these façades (Güner, 2006), by emphasizing the tectonics and plasticity of the building.

Contrary to appearance, objects hold essential significance precisely because they often go unnoticed by our eyes. The less we are aware of them, the more their potential to shape our expectations. In other words, they have so much power on what happens that we are completely unaware of it (Miller, 2010). Wrought iron balcony balustrades are a part of a pool of other minor elements, such as entrance doors, door handles, apartment name and number signage, letterboxes, common area lighting fixtures, and garden fences. Through their so-called "hidden capacity" and unexplored potential, they provide significant clues about the wider material culture of which they are a part.

THREE GROUNDS REGARDING THE PRESERVATION OF ANKARA APARTMENT BALCONY BALUSTRADES

In the case of Turkey, the balcony as a building element has a limited history, and its key role in the Turkish building landscape appears to coincide with the rise of the apartment buildings. Ankara witnessed a rapid process of "apartmentalization" that commenced in the 1950s and gained momentum following the implementation of legislation on flat ownership in 1965. This legislation mandated standardized building designs due to the restrictions imposed by urban parcels (12). Thus, architects and contractors had to seek subtle ways of overcoming the monotony of this new façade form. Regarding the historical background of Ankara apartment balcony balustrades, the study suggests three main justifications for documenting and preserving balustrades as material culture: the authenticity aspect, the technological aspect, and their role in highlighting the relationships among various actors of the construction processes.

Authenticity Aspect

According to the declaration of ICOMOS (2017), "authenticity is the quality of a heritage site to express its cultural significance through its material attributes and intangible values in a truthful and credible manner." Problems of material authenticity, referring to an object's longevity and retention of all its qualities over time, arises from the tension between the

12. The construction of apartment buildings accelerated after Turkey's Flat Ownership Law of 1965, illustrated by the growth in the number of apartment buildings in Ankara from 279 in 1954 to 962 in 1965 (Tekeli, 2012). This promoted the build-sell model, and the ensuing production of apartment buildings as anonymous objects providing individual ownership of apartments within a building (Gürel, 2007).

tendency to preserve and repair, on the one hand, and the inclination to partly or completely replace, on the other (Balamir, 2014).

Another definition of authenticity concerns originality and uniqueness. As Picon (2013) states, the aim of employing ornament as a means of creating an extremely individual approach is generally to declare an identity and a unique vision. To evaluate the distinctiveness of balcony balustrades, it is important to consider their inherent authenticity, which is provided by the peculiarities of local craftsmen. This evaluation is based on observation and experience (Figure 4).

In line with their authentic value, balustrades of Ankara apartment balconies played a symbolic role when interpreted in the context of the period's architectural modernism. In other words, they contributed to the identity of apartment architecture during that period and, thus, contributed to architectural expression in general. Apartments of the 1950s and early 1960s, in particular, can be regarded as a tool of modernization, encompassing various dimensions; "an economic object, a social idea, a cultural expression, a domestic space, and a container of daily life and spatial practices" (Gürel, 2007, 15). Turkish architects and builders of this period considered modern apartments as a symbol of development, hygienic living conditions, higher living standards, and social status (Gürel, 2009), hence, a metaphor of modernization. The balustrades as a component of this modernist language together with other building elements helped to envision modern life. These buildings came to represent modernist characteristics, in which the balustrades became an area for experimentation for architects. This can be regarded as a unique

Figure 4. Balustrades from the research project illustrating authentic qualities (Tuna Ultav archive)





Figure 5. Modern language of several balcony balustrades from the research project (Tuna Ultav archive)



Figure 6. Several balcony balustrades from the research project illustrating ornamental qualities (Tuna Ultav archive)

opportunity to give full emphasis to the modern identity and modern language. In the first place, an effort made to emphasize that architectural language in the designers' decoration may be described as an effort by the owner or the contractors to embellish the building's plain appearance. Briefly, the role of Ankara's balustrades includes both representing the era's modernist language, and the search for an ornamental quality to provide each block with a particular identity (Figures 5-6).

Balcony balustrades, as strong visual elements in buildings, make a considerable contribution to the formal language of the buildings, and through craftsmen's unique touch, can provide authenticity in the face of the standard mass. In addition to their individual authentic identity, replication of balustrade patterns on an urban scale created the characteristics of the city's apartment buildings, and with it, an authentic urban identity. This identity is enriched via the repetition of similar elements within the city, forming visual images shared by the society

13. According to DOCOMOMO, one of the supplementary values is technological value (Omay Polat, 2014).

(Figure 7). As part of urban memory, identity value generally refers to a certain building identity as prominent elements of urban memory. Although the buildings examined here may not be regarded as canonical examples of their era, the frequently repeated patterns nevertheless create a memory value for Ankara's residents.

Technological Aspect

The second aspect that indicates the need for preservation of balustrades is related with their technological value (13). John Macarthur proposes that materials have the power to develop a particular history, i.e., material being composed of both technique and content can be a tool for comprehending the mediums distinguishing different art disciplines (Macarthur, 2014). On the apartment façades, wrought iron balustrades accompanied the dominant material of the 20th century, that is, reinforced concrete. The interviewed craftsmen highlighted their knowledge of the



Figure 7. Similar balcony balustrade samples dispersed across Çankaya District (Tuna Ultav archive)

14. Also, currently President of Ankara Chamber of Blacksmiths and Craftsmen.

technical qualities of the material and the craft aspect of the balustrades. For example, in his interview, craftsman Hayrettin Yıldırım (2021) (14) described the laborious welding technologies that were used in ironwork at the time: joints were made by heating the material to its melting point, piercing it with a punch system, riveting, and welding (H. Yıldırım, personal communication, January 20, 2021). The work was a labor-intensive handcraft. All craftsmen described making iron balustrades entirely by hand, without electric welding or pressing machines. Similarly, Yusuf Özçatalbaş (2020), a metalwork scholar, recalled that craftsmen manually created their own molds and molding systems, which demanded both know-how and skills (Y. Özçatalbaş, personal communication, September 24, 2020). Another interviewee, Sedat Kızılkaya (2021), a craftsman who practiced during the years, also mentioned the knacks of ironwork technology at the time:

“Later, just after industrialization started, production in Denizli [a city in Turkey] started to feature various motifs, in terms of the supply of preliminary material for making iron decorations for windows and balconies. The forge and the iron were brought to Denizli by local merchants and were purchased and assembled. There was no machine welding. Instead, we used riveting or welding the two parts by hand, by heating them with rivets or by a process called “hot welding”. Later, with the introduction of drilling, and making rivets, the process of remanufacturing became a little easier, and more sophisticated with more beautiful results were even more beautiful [...] Of course, we used to do the mantling ourselves. The iron to be used for the construction was piled on one side of the shop, stacked according to size, and taken to the construction site when needed. Things used to be built on site with anvils and then directly put in place, but now it is not like that” (S. Kızılkaya, personal communication, January 31, 2021).

Such anecdotes reveal the state of the construction industry and the availability of technologies at the time. They also indicate the increasing options in construction materials and the evolution of workmanship from traditional methods and materials to contemporary ones. In this respect, preserving balustrades as material culture and reading them as expressions of technological references enrich our understanding of the era.

Complex Relationships Among Various Actors of the Design and Construction Industry

The final aspect that underlines the significance of preservation is the complex relationships among various actors of the design and construction industry. The material object is a vehicle of intentions and designs of a culture, as such, it can socially influence individual behavior (Dant, 2005). Architectural historiography investigates static attributes based on style, the external practices of the actors, and the relationship of their productions. According to Mary Ann Beecher (1998), such historical studies create an understanding of the object’s place in a larger context to ascertain its importance. It is essential to recognize that architectural practice depends not only on the architect as a sole author but also requires various actors and the awareness of architectural history about the mediation of these actors in design practice. Such a view brings an understanding that design reaches beyond the object itself, towards the complex networks of practices and discourses that surrounds it (Kelly, and Jamieson, 2019). Therefore, anthropologists are interested in looking into material culture because the reproduction and consumption of materials bring about social and cultural relationships, which in turn, helps to create materials (Vellinga, 2007).

15. Mazen Haidar (2021), for example, an architectural history scholar who conducted similar research about balcony balustrades in Beirut, stated in his interview that there was a direct exchange of ideas between iron masters and architects or contractors, and these designs were the expression of that exchange (M. Haidar, personal communication, February 24, 2021).

16. This statement was also confirmed by craftsman Mustafa Tan.

Tekeli (2012) lists complex relationships among various actors within the housing realm, namely, tenants, owners, and producers (including architects and contractors), as well as local and central government entities. In case of balustrades, this list also includes craftsmen. To interpret social and cultural relationships, it is important to analyze interactions among architects, contractors, and craftsmen during design and construction, as well as among the craftsmen themselves. Interpreting the influence of these interactions is essential. (15). During an interview, Nesrin Yatman (2021), an architect at the time, emphasized the significant collaboration among various actors involved in the construction of balcony balustrades. This collaboration encompassed the owner, contractor, architect, and craftsmen. There were inspirational sources visible in the city:

“Of course, for these works at that time, such workmanship was not mass produced, as it is now. There were many individual masters who did the job well. The producer or the owner would see one and like it enough to copy it. That is why it has always been this way, that an iron balustrade used for an apartment building at one end of a street was reproduced at the other end, using the same craftsman and the same contractor, this was very common. Therefore, through the contributions of the owner, the producer, the architect, and the master craftsman, these buildings give a city a specific image” (N. Yatman, personal communication, March 4, 2021).

In his interview, Kadri Kalaycıoğlu (2020), a practicing architect at the time, reported that he designed all building components himself, from the balustrade detail to the entire building (K. Kalaycıoğlu, personal communication, August 19, 2020), whereas Mehmet Savaş (2020) stated that he generally worked with qualified masters to achieve a poetic façade language. In his interview, Hasan Tuluk (2020), a metal artist and teacher, revealed that architects were able to reflect their own feelings and thoughts on the building through the work of craftsmen, and he believed that architects benefited from the technical knowledge of the craftsmen (H. Tuluk, personal communication, October 22, 2020). Ahmet Yeşilmeden (2020), an instructor on metalwork, described in his interview how craftsmen would show their prototype works on balcony balustrades to contractors to display their portfolio (A. Yeşilmeden, personal communication, August 20, 2020) (16). In his interview, craftsman Mustafa Tan (2021) declared that they would even offer to take the contractor to the site of their previous work (M. Tan, personal communication, March 14, 2021). Hence, new patterns developed by directly observing and referencing existing craftwork. Another interviewee, Sedat Kızılkaya (2021), a craftsman from that period, stated that design catalogs first appeared around 1960s in Turkey. However, prior to that, craftsmen like himself relied on the ideas from others to some extent or entirely, with minimal input from the architect or contractor. The visual language created through the balustrades developed through reproduction while the façades dispersed throughout the city encouraged the emergence of new façade designs. However, rather than relying on the architects as the sole authors of the entire building, craftsmen independently contributed to the design by experimenting with new work inspired by the balustrades that have already been produced. In his interview, craftsman Cem Turhan Eskitoros (2021) pointed out that craftsmen collaborated with contractors rather than architects (C.T. Eskitoros, personal communication, January 23, 2021). The statements from different actors, including architects and craftsmen, demonstrate the diverse approaches to collaboration and underscore the role of craftwork in architectural practice.

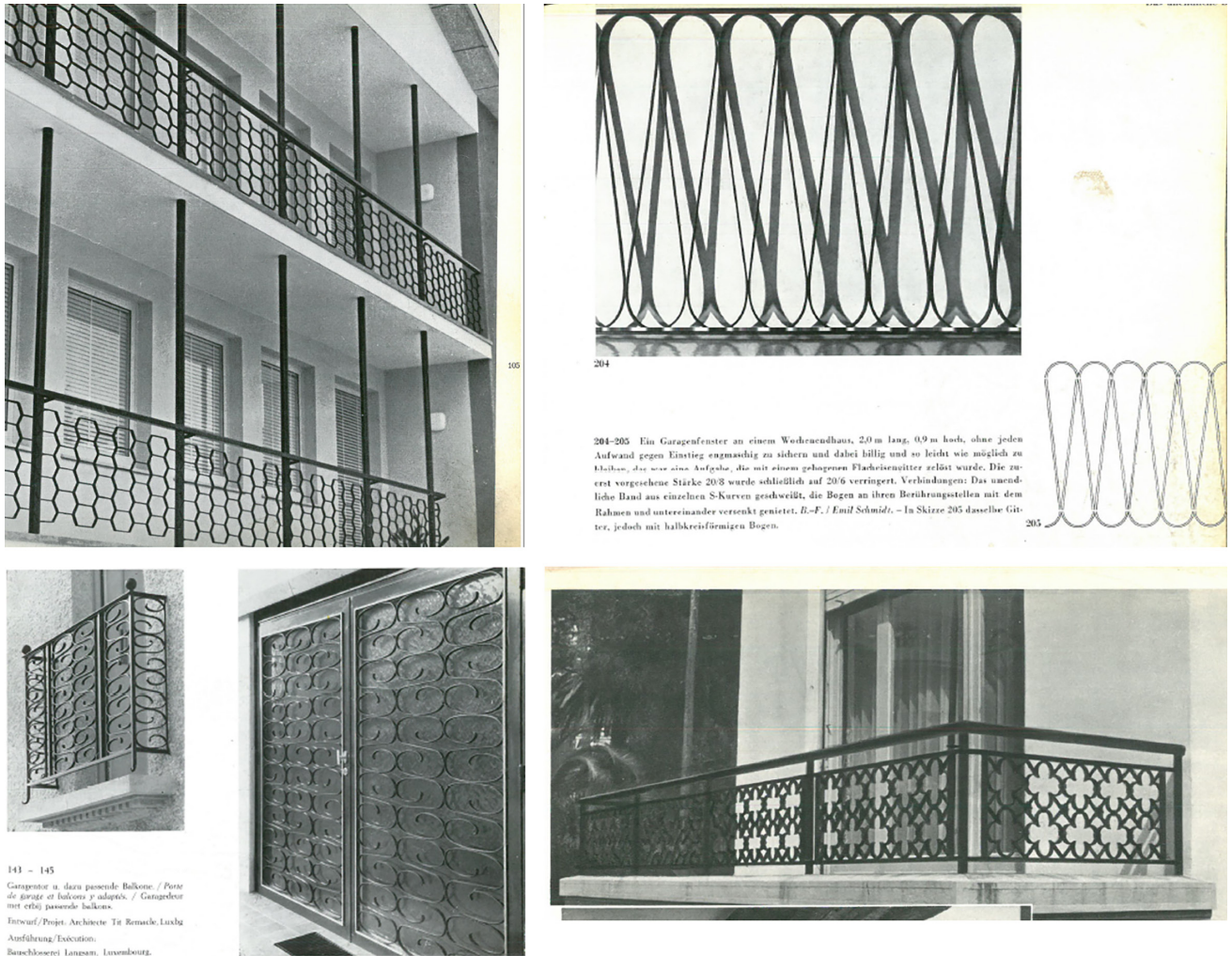


Figure 8. Pages from contemporary French or German catalogs shared by the interviewed craftsmen (Tuna Ultav archive)

One of the highlighted points of the relationship among various actors is the source of inspiration for the balustrades. All interviewees identified a particular inspiration or departure point, implying the absence of the architect in the design process. In this respect, the craftsmen interviewed stated that architects had an insignificant role on the design and production of balustrades. Instead, customers' taste shaped their visual vocabulary. In his interview, Yıldırım (2021) noted that these designs could also spread by word of mouth: a customer would notice an attractive balustrade and show it to the craftsman, who would then create a similar model. According to craftsman İsmail Sağlam (2021), catalogs were useful resources for learning about the processing and shaping of iron, and the use of tools such as anvils, bellows, and hammers to create an annealed material (İ. Sağlam, personal communication, April 5, 2021). He, like many other craftsmen, benefited from those instructions, which guided craftsmen in the use of the sample and pattern, and the work that was suitable for the particular façade (Figure 8) (17). Although not all of the architects or craftsmen of the selected buildings could be reached, this shared information is noteworthy for questioning the architects' approach to balustrade design.

17. Cem Turhan Eskitoros, Sedat Kızılkaya, İsmail Sağlam, and Ekrem Çalışkan are other craftsmen that reported gaining inspiration from international catalogs, especially catalogs from Germany and France. Architect Nesrin Yatman and contractor İrfan Köksalan also stated that they made use of international catalogs (N. Yatman, personal communication, March 4, 2021; İ. Köksalan, personal communication, January 2, 2021).

DIGITAL DOCUMENTATION AND PRESERVATION OF ANKARA APARTMENT BALCONY BALUSTRADES

It may be regarded as paradoxical to consider modern architecture and objects as heritage since modernism rejected tradition in favor of the ephemeral and transitory, presupposing a tabula rasa (Maxwell, 1998; Heynen, 1998). Hence, the idea of preserving balcony balustrades may be controversial. The buildings of 1950-75, are often seen as less worthy of preservation than pre-Republican buildings in terms of academic interest. Additional issues are recognition and ownership of the heritage, conflicting views, lack of methodology, the buildings' age and condition, technical problems, and obsolescence (Balamir, 2014). Nevertheless, it is important not to overlook the preservation of different layers of history and recognize that this layering creates other meanings that reflect wider material culture. The declaration of ICOMOS International Committee on Twentieth Century Heritage (2017) argues that it is essential to preserve modern heritage: "The obligation to conserve the heritage of the twentieth century is as important as our duty to conserve the significant heritage of previous eras" (Madrid-New Delhi Document, 2017, 3). According to this declaration, "contents, fixtures and fittings that contribute to cultural significance should always be retained on the heritage site where possible ... Their removal is unacceptable unless it is the sole means of ensuring their security and preservation. They should be returned where and when circumstances permit" (Madrid-New Delhi Document, 2017, 9). The declaration considers that cultural significance is embodied "in the heritage site itself, its setting, fabric, use, associations, meanings, records, related sites and related objects" (Madrid-New Delhi Document, 2017, 11). This wide range of elements can reasonably include balcony balustrades. It continues: "While it specifically applies to architectural heritage in all its forms, many of its concepts may equally apply to other types of twentieth-century heritage" (Madrid Document, 2011).

In addition to the reasons for preservation of the balustrades, it is also important to discuss the documentation and preservation methods where physical preservation becomes infeasible due to demolition. Hubert-Jan Henket defines preservation as the attempt to maintain "the memory of an artefact for future generations," (Henket, 1998, 15) adding that not all buildings have to be physically conserved. Today, this can simply take the form of digital documentation. In this framework, this study of balcony balustrades as part of material culture raises the issue of the necessity of their digital documentation and preservation. In addition, due to their communicative role, these apartment balcony balustrades expanded the formal repertory of Ankara's architecture between 1950 and 1975, taking on a role as a representative element in the residents' collective memory of their physical, socio-economic, and socio-political environment. With regard to the values raised within this study, their digital documentation before the processes of demolition is suggested. Their preservation is crucial in this particular case, since their total disappearance would remove a rich collection of memories and cultural references.

The declaration by ICOMOS (2017) sees archiving as an important part of conservation planning. Depending on the circumstances, recording techniques may include "photography, technical drawings, oral histories, laser scanning, 3D modeling and sampling" (Madrid-New Delhi Document, 2017, 6). To achieve the main purpose of the study, to preserve a rich and accessible archived record of architectural building



Figure 11. Map showing 1,850 apartment buildings scanned at Çankaya District within the research project* and similar balcony balustrade samples dispersed across the district (Savasta and Tuna Ultav archives)

* Color coding represents groups of different neighborhoods.

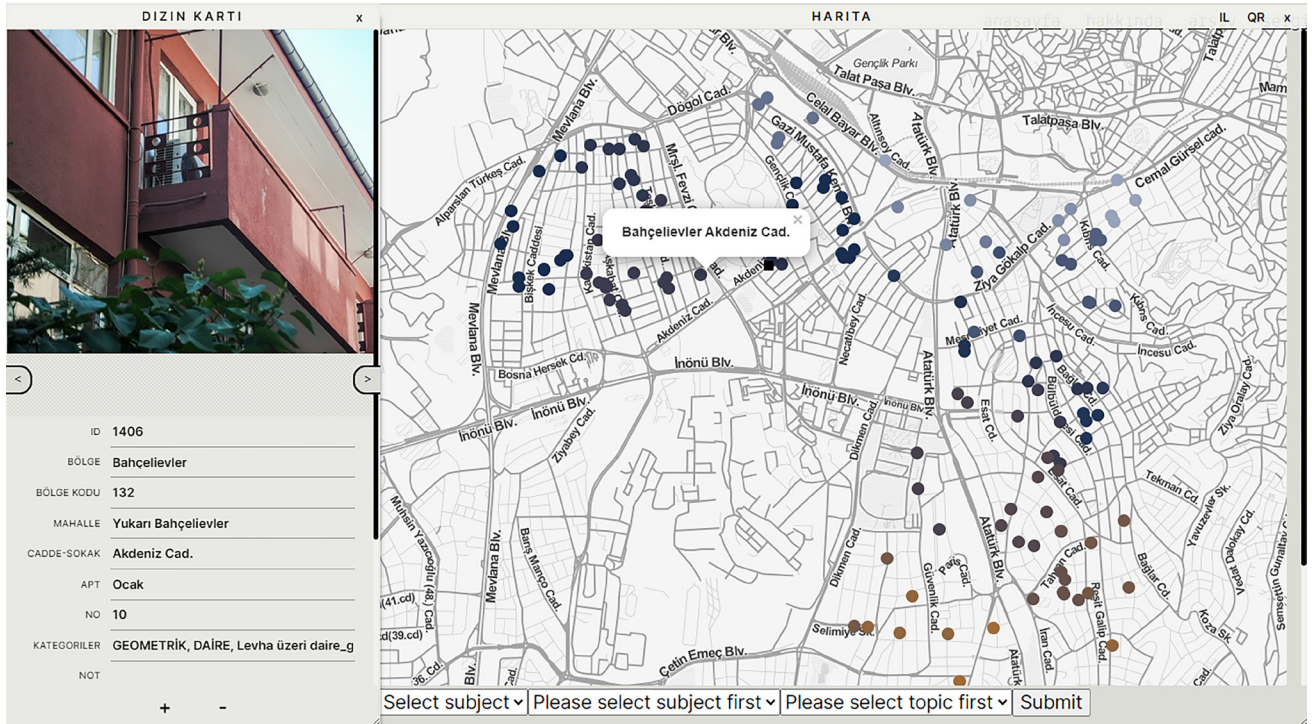


Figure 12. An example selection of a pattern category on the map (Savasta and Tuna Ultav archives)

software visualizes the entire database, thereby allowing the user to discover information about the balustrades, such as their aesthetic features, distribution in the neighborhood/city, and material qualities. Balustrades with similar patterns and the same or different interpretations are dispersed across the city (19).

According to UNESCO, digital heritage recognizes employment of technology in history-making: "Individuals, organizations and communities are using digital technologies to document and express what they value and what they want to pass on to future generations. New forms of expression and communication have emerged that did not exist previously" (UNESCO, 2015 as cited in Purkis, 2017, 436). As a result, in the digital medium, the meaning of an object rests neither with the artefact's material reality nor with the perceiving individual but is located in-between. This virtuality of the "meaningful object" conditions the capacity of material culture to mediate (Chestnova, 2017, 9).

CONCLUDING REMARKS

This study shows how reading balcony balustrades as material culture can develop a more extensive understanding of the period's building culture shaped by multiple dynamics. Documentation and analysis of balustrades as craftwork exposes the authentic and technological aspects of the era and relationships among various actors of the construction process. This was achieved through the documentation and analysis of a relatively minor element of apartment building typology, namely, wrought iron balustrades as craftwork. Although small in scale in relationship to the building to which they belong, these elements can be considered noteworthy components of twentieth century architectural heritage, and their study can contribute to a multi-layered understanding of a specific period. The preservation of meanings inherent in material culture is sustained through the preservation of its material artefacts, and the documentation of their multifaceted relationships with the societies that surround them. This allows us to make a complex interpretation of the material culture with its many actors, as a process shaped by many dynamics. In instances when preservation of the real object or material is not possible, digital documentation evolves as a useful instrument in recording wrought iron balustrades as a part of architectural heritage. Accordingly, digital documentation as a tool enables an alternative reading of the city and enrich our understanding of the built environment beyond the mainstream architectural histories. Simultaneously, it helps to preserve their memory.

If a building or any of its architectural elements, such as doors and windows, continue to maintain the architectural understanding of the original period by demonstrating the contemporary understanding of decoration and revealing the way the building materials were used, then, through all these qualities, it can be defined as an original element. The greater its authenticity, the easier it is to understand that structure and the period it represents, and obtain the necessary information through their transmittance of meaning. Balustrades make a unique contribution to the otherwise undecorated apartment façades of the era, dressing them with individuality. Therefore, balustrades both gives an identity and surprise passersby through their authentic language that enhances the plasticity of the apartment buildings' façades.

Wrought iron balcony balustrades communicate the aesthetic and technological level of the era's architectural and craft practices. In as much as buildings themselves can speak, certain details through their formal and material properties can speak about specific architectural details of the period, whether to passersby or researchers. By doing so, they illustrate the aesthetical and technical approaches, revealing an architectural culture of their era that is more extensive than it may otherwise seem.

19. Figure 11 exemplifies how the "Wavy" category spread across a large geography. Figure 12 shows what appears on the website when the user selects a particular category ("Geometric") and sub-category ("Circle") from the tabs below the map.

This study has the potential to encourage further discussions on material culture and how it reflects society. That is, the need for a decorative element or ornamentation revealed here can be seen as resistance to the emerging apartment production with rational façades. Further research could help to understand the dynamics behind this effort at diversification to understand the origins of this differentiation in terms of the nature of the actors and possible regional differences within or between cities. It could also show how investigating buildings' balustrades can reveal alternative narratives about everyday practices, thereby uncovering a multi-layered aspects of the culture.

BIBLIOGRAPHY

- ARONIS, C. (2022) Architectural Liminality: The Communicative Ethics of Balconies and Other Urban Passages, *Cultural Studies* 36(3) 475-501.
- BAILEY, D., MCFADYEN, L. (2010) Built Objects, *Material Culture Studies*, eds. D. Hick, M.C. Beaudry, Oxford University Press, Oxford; 562-87.
- BALAMİR, A. (2014) Modern Mirasın Korunması [Conservation of the Modern Heritage], *Korumda Sivil Mimarlık Çalıştay Notları II [Civic Architecture in Conservation Workshop Notes II]*, ed. N. Bayraktar, VEKAM Yayınları, Ankara; 37-55.
- Balcony* (2014). 14th International Architecture Exhibition, Marsilio, Venice.
- BALIK, D., ALLMER, A. (2016) A Critical Review of Ornament in Contemporary Architectural Theory and Practice, *A|Z Journal of the Faculty of Architecture* 13(1) 157-169.
- BAYRAKTAR, N. (2017) *Ankara Yazıları [Ankara Articles]*, Nobel Akademik Yayıncılık, Ankara.
- BEECHER, M.A. (1998) Toward a Critical Approach to the History of Interiors, *Journal of Interior Design* 24(2) 4-11.
- BK at the Biennale: Anatomy of a Balcony* (2014) [<https://www.tudelft.nl/en/2014/bk/bk-at-the-biennale-anatomy-of-a-balcony/>] Access Date (10.08.2021).
- BOZDOĞAN, S. (2016) Turkey's Post-War Modernism. A Retrospective Overview of Architecture, Urbanism and Politics in the 1950s, *Mid-Century Modernism in Turkey: Architecture across Cultures in the 1950s and 1960s*, ed. M.Ö. Gürel, Routledge, New York and London; 9-26.
- BOZDOĞAN, S., AKCAN, E. (2012) *Turkey. Modern Architectures in History*, Reaktion Books, London.
- BUCHLI, V. (2002) *The Material Culture Reader*, Berg, Oxford and New York.
- CENGİZKAN, A. (2000) *Discursive Formations in Turkish Residential Architecture. Ankara: 1948-1962*, unpublished Ph.D. Dissertation, Middle East Technical University, Ankara.
- CENGİZKAN, A. (2002) *Modernin Saati [The Clock of the Modern]*, Mimarlar Derneği 1927 ve Boyut Yayın Grubu, Ankara, İstanbul.
- CHATTERJEE, A. (2014) Introduction Surface Potentialities, *Surface and Deep Histories: Critiques and Practices in Art, Architecture and Design*, ed. Anuradha Chatterjee, Cambridge Scholars Publishing, Newcastle upon Tyne.

- CHESTNOVA, E. (2017) The House That Semper Built, *Architectural Theory Review* 21(1) 44-61.
- CHILTON, E.S. (1999) Material Meanings and Meaningful Materials: An Introduction, *Material Meanings: Critical Approaches to the Interpretation of Material Culture Foundations of Archaeological Inquiry*, ed. E.S. Chilton, University of Utah Press, Salt Lake City; 1-6.
- DANT, T. (2005) *Materiality and Society*, Open University Press, New York.
- DAVIDOVICI, I. (2004). Abstraction and Artifice, *OASE* (65) 100-141.
- FERGUSON, L. (1977) *Historical Archeology and the Importance of Material Things*, Society for Historical Archaeology, Maryland.
- FORTY, A. (2014) Future Imperfect, *Forty Ways To Think Architecture*, eds. I. Borden, M. Fraser, B. Penner, John Wiley & Sons, New Jersey; 17-32.
- Fundamentals Catalogue* (2014). 14th International Architecture Exhibition, Marsilio, Venice.
- GLASSIE, H. (1999) *Material Culture*, Indiana University Press, Bloomington.
- GOSS, J. (1988) The Built Environment and Social Theory: Towards an Architectural Geography, *The Professional Geographer* 40(4) 392-403.
- GÜNAY, D. (2013) *Ankara Spatial History*, Orta Doğu Teknik Üniversitesi Mimarlık Fakültesi, Ankara.
- GÜNER, D. (2006) İzmir’de Modern Konut Mimarlığı 1950-2006 [Architecture of Housing in Turkey 1950-2006, *Planlama*(3) 123-141.
- GÜREL, M.H. (2007) *Domestic Space, Modernity, and Identity: The Apartment in Mid-20th Century Turkey*, unpublished Ph.D. Dissertation, University of Illinois at Urbana Campaign, Illinois.
- GÜREL, M.Ö. (2009) Defining and Living out the Interior: The ‘Modern’ Apartment and the ‘Urban’ Housewife in Turkey during the 1950s and 1960s, *Gender, Place and Culture* 16(6) 703-22.
- Haidar, M. (2022) *La Ferronnerie Architecturale à Beyrouth au XXe Siècle*, Geuthner Publications, Paris.
- HENKET, H.J. (1998) The Icon and the Ordinary, *Modern Movement Heritage*, eds. A. Cunningham, R. Maxwell, E & F.N. Spon, London; 13-17.
- HEYNEN, H. (1998) Transitoriness of Modern Architecture, *Modern Movement Heritage*, eds. A. Cunningham, R. Maxwell, E & F.N. Spon, London; 29-36.
- KELLY, J., JAMIESON, C. (2019) Practice, Discourse and Experience: The Relationship Between Design History and Architectural History, *Journal of Design History* 33(1) 1-15.
- MACARTHUR, J. (2014) Of Character and Concrete: The Historian’s Material, *Forty Ways to Think Architecture*, eds. I. Borden, M. Fraser, B. Penner, John Wiley & Sons, New Jersey; 150-54.
- KIRAY, M. (1982). Apartmanlaşma ve Modern Orta Tabakalar [Apartmentization and Modern Middle Strata], *Toplum Bilim Yazıları*, Gazi Üniversitesi, Ankara; 385-87.

- MADRAN, E. (2006) Modern Mimarlık Ürünlerinin Belgeleme ve Korunması Süreci için Bazı Notlar [Some Notes on the Process of Documenting and Preserving Modern Architectural Products], *Mimarlık* (332). [<http://www.mimarlikdergisi.com/index.cfm?sayfa=mimarlik&DergiSayi=50&RecID=1207#>] Access Date (10.04.2022).
- MADRID DOCUMENT (2011) Approaches to the Conservation of Twentieth-Century Cultural Heritage, ICOMOS International Committee on Twentieth Century Heritage [<http://www.icomos-isc20c.org/madrid-document-archives/>] Access Date (10.04.2022).
- MADRID-NEW DELHI DOCUMENT (2017) Approaches to the Conservation of Twentieth-Century Cultural Heritage, ICOMOS International Committee on Twentieth Century Heritage [https://www.icomos.org/images/DOCUMENTS/Working_Groups/SDG/ICOMOS_2017_Madrid-Delhi_Document-_Conservation_of_20c_Heritage-_en-fr-es.pdf] Access Date (10.04.2022).
- MAXWELL, R. (1998) Preface, in *Modern Movement Heritage*, eds. A. Cunningham, R. Maxwell, E & F.N. Spon, London; xiii.
- OMAY POLAT, E. (2014) Modern Mirasın Korunması [Conservation of the Modern Heritage], *Korumada Sivil Mimarlık Çalıştay Notları II [Civic Architecture in Conservation Workshop Notes II]*, ed. N. Bayraktar, VEKAM Yayınları, Ankara; 56-71.
- PICON, A. (2013). *Ornament: The Politics of Architecture and Subjectivity*, New Jersey, John Wiley & Sons; 39-40.
- PROWN, J.D. (1982) Mind in Matter: An Introduction to Material Culture Theory and Method, *Winterthur Portfolio* 17(1) 1-19.
- PURKIS, H. (2017) Making Digital Heritage about People's Life Stories, *International Journal of Heritage Studies* 23(5) 434-444.
- SAUNDERS, A. (2017) Material Manifestations, *Journal of Architectural Education* 67(1) 86-95.
- SAVASTA, D., KOCABIYIK, E. (2021) Designing a Computational Interface for the Study of Collections: 'Grouper' as a Research Tool, *NERD - New Experimental Research in Design 2: Positions and Perspectives*, eds. M. Christensen, R. Michel, W. Jonas, Birkhäuser, Basel; 120-145.
- SCHLERETH, T.J. (1982) *Material Culture Studies in America: An Anthology*, AltaMira Press, Lanham.
- SEY, Y. (1998) Cumhuriyet'in 75. Yılı, Gecekondu'nun 50. Yılı [75th Anniversary of the Republic, 50th Anniversary of the Gecekondu], *75 Yılda Değişen Kent ve Mimarlık [City and Architecture Shifting in 75 Years]*, eds. Y. Sey, D. Özkan, Tarih Vakfı Yayınları, İstanbul.
- SILKE, S. (2016) Taking Berger and Luckmann to the Realm of Materiality: Architecture as a Social Construction, *Cultural Sociology* 10(1) 93-108.
- STUHLMACHER, M. (2004) Vanity and Self-will. The Complex, Contradictory Work of Hild Und K, *OASE* (65) 26-39.
- ŞUMNU, U. (2018) *Mimarlar ve Apartmanları. Ankara'da Konut ve Barınma Kültüründen Örnekler [Architects and their Apartments. Examples of Housing and Housing Culture in Ankara]*, Kitap Yayınevi, İstanbul.

- TANYELİ, U. (2004) *İstanbul 1900-2000. Konutu ve Modernleşmeyi Metropolden Okumak [İstanbul 1900-2000. Reading Housing and Modernization from the Metropolis]*, Akın Nalça Yayınları, İstanbul.
- TEKELİ, İ. (1996) *Konut Tarihi Yazıcılığı Üzerine Düşünceler [Reflections on House Historiography]*, *Tarihten Günümüze Anadolu'da Konut ve Yerleşme [Housing and Settlement in Anatolia from History to the Present]*, ed. Yıldız Sey, Tarih Vakfı Yayınları, İstanbul; 6-14.
- TEKELİ, İ. (2012) *Türkiye'de Yaşamda ve Yazında Konutun Öyküsü (1923-1980) [The Story of Housing in Life and Literature in Turkey (1923-1980)]* Tarih Vakfı Yurt Yayınları, İstanbul.
- TRILLING, J. (2001) *The Language of Ornament*, Thames and Hudson, London and New York.
- TRENTMANN, F. (2016) *Empire of Things How We Became a World of Consumers, from the Fifteenth Century to the Twenty-first*, Allan Lane, UK.
- ULUSOY, H.A. (2013) *Bir Kentin Tarihi Serencamı Ankara [The Historical Event of A City Ankara]*, İtalik Yayınları, Ankara.
- VELLINGA, M. (2007) Review Essay: Anthropology and the Materiality of Architecture, *American Ethnologist* 34(4) 756-766.
- YAGOU, A. (2007) City Lights: A Detail of Greek Interwar Modernism, *Design Issues* 23(1) 18-27.

Alındı: 03.07.2022; Son Metin: 12.04.2023

Anahtar Sözcükler: Maddi kültür; modern mimari miras; bellek; balkon korkulukları; dijital belgeleme.

ANKARA APARTMAN BALKON KORKULUKLARININ (1950-75) MADDİ KÜLTÜR OLARAK OKUNMASI VE DİJİTAL BELGELEMESİ

Bu makale, demir balkon korkuluklarının maddi kültür olarak yeterince keşfedilmemiş potansiyelini ele almakta ve belirli bir zamanın tasarım kültürü ve daha geniş çerçevede toplum hakkında önemli ipuçları vermektedir. Bu çalışma, 1950-1975 yılları arasında Ankara'da inşa edilmiş apartmanların demir balkon korkuluklarını inceleyerek, Türkiye'deki modern mimarlık kültürünün kapsamının genişletilmesine potansiyel olarak katkıda bulunurken, bu öğelerin bu kültürün maddi kanıtı olarak belgelenmesinin ve korunmasının önemini vurgulamaktadır. Balkon korkuluklarına ilişkin veriler, Ankara'nın Çankaya ilçesindeki 1850 apartmana odaklanan bilimsel bir araştırma projesiyle elde edilmiştir. Çalışma özellikle, korkulukların özgünlük yönünü, teknolojik yönünü ve inşaat sürecinin çeşitli aktörleri arasındaki ilişkilere ışık tutmadaki rolünü analiz etmektedir. Konuyu daha geniş bir bağlama oturtmak için araştırma, maddi kültür ve modern mimarlık mirasının korunması üzerine literatür taraması yapmakta ve yarı yapılandırılmış görüşmelerden ve saha çalışması sırasında çekilmiş olan geniş bir fotoğraf koleksiyonundan elde edilmiş verilerin analizini sunmaktadır. Çalışma, dönemin maddi kültürüne daha fazla ışık tutmak ve belleklerdeki yerlerini korumak üzere, sonuç olarak, demir balkon korkuluklarının çok katmanlı okunması aracılığıyla dijital belgeleme yöntemleri önerisini getirmektedir.

READING ANKARA APARTMENT BALCONY BALUSTRADES (1950-75) AS MATERIAL CULTURE AND THEIR DIGITAL DOCUMENTATION

This paper considers the underexplored potential of wrought iron balcony balustrades as material culture, providing significant clues about a design community of a certain time and society at large. Exploring the wrought iron balcony balustrades of apartment buildings constructed in Ankara between 1950 and 1975, the study potentially contributes to widening the scope of the field of modern architectural culture in Turkey, while underscoring the significance of documenting and preserving these items as material evidence of this culture. Data on balcony balustrades were obtained through a scientific research project focused on 1,850 apartment buildings in Ankara's Çankaya District. In particular, the study analyzes the balustrades' authenticity and technological aspect, and their role in shedding light on the relationships among various actors of the construction process. To provide a broader perspective, the study situates the issue within the wider context by conducting a literature review on material culture and the preservation of modern architectural heritage. Furthermore, the research incorporates an analysis of data from semi-structured interviews and an extensive collection of fieldwork photographs. The study concludes with a proposal for digital documentation methods to allow further light to be shed on the period and to preserve their memory, through a multi-layered reading of wrought iron balcony balustrades.

ZEYNEP TUNA ULTAV; B.Arch, M.Arch, PhD.

Received her B.Arch and M.Arch degrees from Middle East Technical University (1999, 2022); and her PhD. degree in architecture from Gazi University (2008). Major research interests include modern architecture/interiors in Turkey, architecture and fiction, and tourism architecture. zeynep.tunaultav@yasar.edu.tr

DANIELE SAVASTA; B.Des, M.Des, PhD.

Received his B.Des in Industrial Design from the University of Palermo and his M.Des from Iuav University of Venice. He earned his PhD in design sciences from Iuav University of Venice in 2015. He is currently an assistant professor in interaction and information design, with a particular interest in data visualization, cultural heritage, games, and interactive installations. daniele.savasta@gmail.com

MELTEM Ö. GÜREL; B.S., M.Arch and Ph.D.

Received her B.S., M.Arch and Ph.D. in Architecture from the University of Illinois at Urbana-Champaign. Currently works as a Professor at Yaşar University. Major research interests include cross-cultural histories of modern architecture, gender-space, culture-space, and displaced people. She is the editor of Mid-Century Modernism in Turkey. meltem.gurel@yasar.edu.tr

MİMAR TURGUT CANSEVER'İN TASARIM DÜŞÜNCEİ ÜZERİNE ANTALYA KARAKAŞ CAMİİ BAĞLAMINDA BİR ÇÖZÜMLEME

Kemal Reha KAVAS*, Serkan KILIÇ**

Alındı: 18.09.2021; **Son Metin:** 20.04.2023

Anahtar Sözcükler: Turgut Cansever;
Karakaş Camii; Antalya; tarihselcilik;
bölgeselcilik.

1. Cansever'in meslek yaşamı ile örtüşen
Türk mimarlığında kuramsal altyapıya karşı
genel ilgisizlik bulunur (Bozdoğan, 1990).

2. Mimarın doğrudan cami işlevli iki projesi
Riyad Camii teklif projesi (1987) ve Karakaş
Camii'dir (1991-1998). (Düzenli, 2019, 29-33).

GİRİŞ

"Demir evlerinin başlamasını takiben beni meslek hayatımda çok mesut eden bir görev ile karşı karşıya kaldım. Doğduğum şehir Antalya'da, Hadrian Kapısı'nın karşısında, bir cami yapma görevi bana tevdi edildi." (Cansever, 2004).

Ankara'daki Türk Tarih Kurumu, Bodrum'daki Erteğün Evi ve Demir Turizm Kompleksi projeleri ile 1980 ve 1992 yıllarında Uluslararası Ağa Han Mimarlık Ödülü kazanan Turgut Cansever, dünyada bu ödülü üç kez alan tek isimdir. 1940'lı yıllarda İstanbul Güzel Sanatlar Akademisi'nden mimar ve İstanbul Üniversitesi'nden sanat tarihi doktoru unvanlarını alan Cansever, kuramsal çabalarıyla dönemin mimarlarından ayrılmaktadır (Düzenli, 2016, 249-50) (1). Mimarlığı günlük sorunları çözen teknik bir faaliyetin ötesinde, felsefe, din ve sanat ile aynı düzeyde varoluşsal bir disiplin olarak konumlandırılan Cansever, tasarımlarını tutarlı bir felsefi sisteme dayandırmaya çalışmaktadır (Aydın, 1997, 324).

Bu çalışma, Cansever'in düşünsel altyapısının tasarım kararlarındaki etkilerini Antalya Karakaş Camii bağlamında tartışmaktadır. Mimarın tasarım düşüncesini çözümlemek üzere Karakaş Camii'nin seçilmesi üç nedene dayanmaktadır. İlk olarak yapı, mimarın tarihsel referanslar, çevresel koşullar, geleneksel malzemeler ve çağdaş teknikler arasında senteze vardığı, dolayısıyla kuramsal söylemi ile tasarımları arasında sürekliliğin öne çıktığı 1980'lerden 2000'e uzanan döneme aittir (Üstün vd., 2019). İkinci olarak, Karakaş Camii mimarın doğum yeri olan Antalya'da inşa edilen tek eseridir. Üçüncü olarak ise yapı, İslâmî kavramlara sıklıkla başvuran Cansever'in inşa edilen tek cami tasarımıdır (2). Karakaş Camii, Cansever'in kuramsal söylemi ile tasarım kararları arasındaki sürekliliği incelemek için anlamlı veriler sunmaktadır.

Cansever'in yapılarını kuram – uygulama ilişkisi çerçevesinde sorgulayan çalışmalar, bir geç dönem eseri olarak Karakaş Camii'ni incelemiştir (Düzenli, 2019; Üstün vd., 2019). Özel olarak bu yapıya

* Faculty of Architecture, Akdeniz University, Antalya, TÜRKİYE.

** Corresponding Author; Faculty of Architecture, Akdeniz University, Antalya, TÜRKİYE.

odaklanan çalışmalar ise genel kategorilere başvurmuştur. Tanyeli, yapıyı tarihselcilikte özgün bir yaklaşımın temsilcisi olarak görmektedir (Tanyeli, 2001). Yapı hakkındaki diğer çalışmalar çoğunlukla kuramsal zemine dayanmayan nicel tanımlamalar yapmaktadır (3). Cansever'in tasarımlarının yüksek niteliği üzerinde mutabakat bulunsa da kuramsal söylemi ile tasarımları arasında süreklilik olmadığı da düşünülmüştür (Tümer, 2008). Bu çalışma Cansever mimarlığında söylem ile uygulama arasındaki ilişkiyi yeniden sorgulamaktadır. Konu tekil bir örnek olarak Karakaş Camii bağlamında, felsefe ve sanat tarihine başvuru ile sağlanan kuramsal derinlikte tartışılmaktadır.

Cansever'in tasarım düşüncesini ve eserleri üzerindeki etkilerini sorunsallaştıran akademik çalışmalar, genelde mimarın eserlerini tarihselcilik ve bölgeselcilik akımları ile ilişkilendirmektedir (Tanyeli, 2001; Demirgüç, 2006; Düzenli, 2019, 114). Karakaş Camii özelinde kuram – uygulama sürekliliğinin tartışılması için öncelikle Cansever'in tasarımlarının bu uluslararası akımlar ile ilişkileri ve mimarın söyleminde öne çıkan temel kavramlar incelenmelidir. Cansever'in söyleminin ve eserlerinin genel değerlendirmesine dayalı kavramsal altyapıdan hareket ile Karakaş Camii'nin mekânsal organizasyonunu, ölçeğini, yapı malzemeleri ve tekniklerini biçimlendiren tasarım kararları üzerine bir çözümleme yapılmaktadır.

TURGUT CANSEVER'İN MİMARİ TASARIMLARI VE KARAKAŞ CAMİİ

Cansever'in mesleki yaşamında müellifi olduğu 87 projeden 24 adedi kısmen veya bütünüyle uygulanmıştır (Düzenli, 2019, 100). Hasol'un 20. Yüzyıl Türkiye Mimarlığı seçkinde Cansever'in dört eseri yer almaktadır. Anadolu Kulübü ve Karatepe Açık hava Müzesi Modernizm / Uluslararası Üslup başlıklı 1950'lerde, Türk Tarih Kurumu tekdüzeliğe karşı arayışlar başlıklı 1960'lar ve 70'lerde, Demir Turizm Kompleksi küreselleşme ve neoliberalizm etkileri başlıklı 1980-2000 arasında incelenmektedir (Hasol, 2017). Cansever'in biyografik incelemelerinde modernist etkiler ile geleneksel biçim yorumlamaları arasındaki ilişkilere dayalı dönemlendirmeler yapılmıştır (4) (Düzenli, 2009; Üstün vd., 2019). Düzenli, Cansever'in kariyerini birinci dönem, geçiş dönemi ve ikinci dönem olarak üçe ayırmaktadır. Birinci dönem Modern estetik ile geleneksel kodların çakıştırılması (1951-1959), ikinci dönem geçiş dönemi (1964-1976), üçüncü dönem (1980-2001) geleneksel biçime doğrudan yönelme (1980-1983) ve yeniden sistemleştirme arayışları (1985-2001) olarak tanımlanır (Düzenli, 2009, 136). Başka bir incelemede Cansever'in ilk dönemi 1950'li ve 60'lı yıllarda meslekteki ilk yıllar ve deneyimler (1950'ler ve 60'lar), Osmanlı sivil mimarisi, Selçuklu ve anıtsal Osmanlı mimarisi, İslâm dini ve kültürünün etkilerinin görüldüğü yıllar (1960'lardan 80'lere kadar), üçüncü dönemi tüm deneyimlerin bir senteze ulaşması (1980'lerden 2000'lere) olarak tanımlanır (Üstün vd., 2019). Dönemlendirmelerin tarih aralıkları ve sınıflandırmalar açısından örtüştüğü, Hasol'un genel seçkinde de Cansever'in benzer tarih aralıklarındaki üç farklı dönemde incelendiği görülmektedir. Tasarım anlayışındaki kronolojik değişimi açıklamaya çalışan Tanyeli, Cansever'in adeta eğimli bir yüzey üzerinde sürekli biçimde daha yerli bir mimarlık ve söylem yaratmaya doğru ilerlediği kanısındadır (Tanyeli, 2001, 20).

Bu çalışmanın sınırlarında Cansever'in tüm yapıtlarının derinlemesine incelemesi mümkün olmadığından yukarıda değinilen dönemlendirmelere

3. Yapıyı sadece nicel tanımlamalar ile inceleyen bir çalışma için: Bkz. Ertuğrul, 2020, 157-174.

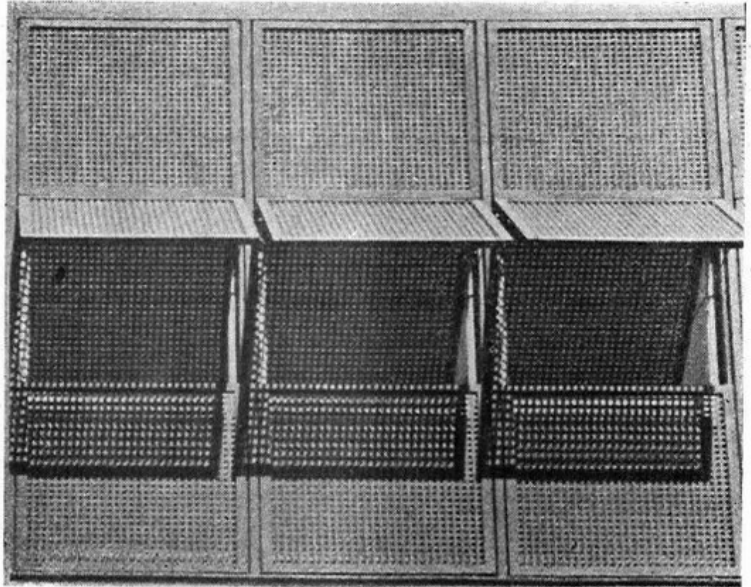
4. Cansever'in yaklaşımında farklı düzeylerde hissedilen modernist ve geleneksel biçim etkileri doktora ve doçentlik tezlerine dayanır. Doktora tezi Anadolu, Selçuk ve Osmanlı Sütun Başlıkları (1949) konusundayken doçentlik tezi Modern Mimarlığın Temel Meseleleri (1960) kapsamında Wright, Gropius, Mies, Corbusier ve Aalto'nun tasarımlarını değerlendirir (Deniz, 2009, 444; Deniz, 2020, 107).

konu olan başlıca yapılarının kısa açıklamaları ve tasarıma yaklaşımdaki genel gelişim çizgisinin belirlenmesi ile yetinilmektedir. Bu incelemenin hedefi, Karakaş Camii'nin genel gelişimde nereye oturduğunu tespit etmektir.

Büyükada Anadolu Kulübü (1951-1957) Cansever'in birinci döneminde değinilen başlıca örnektir (**Resim 1, 2**). Yapı 2. Ulusal Mimarlık döneminin kapatan ve Corbusier etkilerini yerli bir duyarlılık ile bütünleştiren Modern bir eser olarak yorumlanır (Tanyeli, 2001, 20). Hasol yapının Uluslararası Üslubun Türkiye'de çok gözde olduğu dönemin, rasyonel ve işlevselci yaklaşımını ortaya serdiğini vurgular (Hasol, 2017, 143). Cephelerde geleneksel mimari öğelerin yorumları olan güneş kırıcılar ve ahşap kafesler yer almaktadır (Cansever ve Hancı, 1959). Cansever'in eserleri arasında Batılı etkilerin en çok hissedildiği örnek olarak değerlendirilen yapının plan organizasyonu Le Corbusier'in Paris Üniversitesi'ndeki İsviçre Pavyonu ile benzerdir (Üstün vd.,2019, 232).



Resim 1. Büyükada Anadolu Kulübü
(Arkitera, 2022)



Resim 2. Büyükada Anadolu Kulübü
cephesindeki güneş kırıcılardan detay
(Cansever, T. ve Hancı, A. 1959, 48)

1980 ve 1992'de Ağa Han Ödülleri kazanan Türk Tarih Kurumu (1951-1967) (**Resim 3, 4**) ve ilk proje tarihi 1971-72 yılları olup 1983'den itibaren uygulanan Demir Turizm Kompleksi (**Resim 5**) Cansever'in ikinci dönemine örnek gösterilen başlıca yapılarıdır. İlk örnekte, merkezî avlu etrafında mekânların düzenlendiği Selçuklu ve Osmanlı medreseleri yorumlanmaktadır (Üstün vd., 2019, 239). Proje çağdaş yapı teknolojisini geleneksel fikirlerle birleştirmenin başarılı bir örneği olarak görülmektedir (Ekincioğlu, 2001, 64). Yapı, iki bloktan oluşmaktadır. Girişi içeren kare planlı blokta, üstten doğal aydınlatma ile dışa kapalı, içine topladığı değerleri koruyan bir karakter üretilmesi hedeflenmiştir. (Cansever, 1966, 27). Yapıda yerel malzemelerin çağdaş malzeme ve teknikler ile birlikteliği vurgulanmaktadır (Hasol, 2017, 170). Ormanlar ile çevrili bir vadiye 3 otel ve 500 kadar evden oluşan Demir Turizm Kompleksi ise Bodrum'un geleneksel konutlarındaki mimari dili, ölçeği ve kütleli ilişkileri sürdürmektedir (Ekincioğlu, 2001, 136).



Resim 3. Türk Tarih Kurumu Binası (TTK, 2022a)



Resim 4. Türk Tarih Kurumu Binası giriş bloğu, iç mekân (TTK, 2022b)



Resim 5. Turgut Cansever Demir Turizm Kompleksi (ARKİTEKTUEL, 2017)

Sualtı Arkeoloji Enstitüsü (1988-1996) (Resim 6) ve Karakaş Camii (1991-1998) (Resim 7) geleneksel biçimlere doğrudan yönelme eğilimini yansıtan üçüncü dönemin temsilcileridir (Düzenli, 2019, 136). Coğrafi ve iklimsel koşullara duyarlılıkla geleneksel malzeme, teknik ve biçimler, özellikle Selçuklu ve Osmanlı Dönemi'nin mimari öğeleri olan tonoz, kubbe ve aydınlık fenerleri, sıklıkla kullanılmıştır (Üstün vd., 2019, 241).

Düzenli, Cansever'in tasarımlarında biçime yansıyan kaynakları üç grupta incelemektedir (2019, 154). İlki modern ve sonrası mimari çerçevesinde Mies, Corbusier ve Wright eserlerinde görülen saf biçimler ve brütalizm ile modern sonrası dönemdeki rejyonalizmin etkileridir. İkincisi Selçuklu, Osmanlı anıtsal mimarisi kapsamında tonoz, kubbe, baca, ışık feneri gibi öğelerdir. Üçüncüsü ise Osmanlı sivil mimari geleneği kapsamında taş, ahşap, kiremit gibi geleneksel malzemelerin kullanımı, pencere ve kapı oranları, cumba, saçak, söve gibi öğelerin yorumu ve iklimsel verilere duyarlı biçimlerdir. Özellikle ikinci ve üçüncü grup kaynaklar Cansever'in

Resim 6. Turgut Cansever Sualtı Arkeoloji Enstitüsü (INA, 2022)

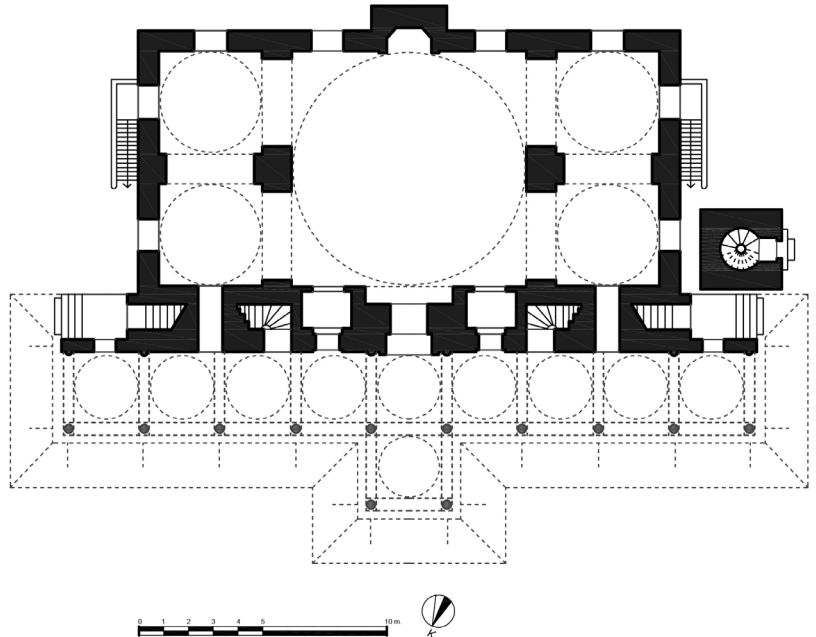




Resim 7. Karakaş Camii ve Hadrianus Kapısı genel görünüm

son döneminde yoğunlaşmaktadır. Sualtı Arkeoloji Enstitüsü'nde sığağa karşı önlem olarak çalışma mekânlarının avlulu medrese plan şeması içinde ele alınarak kuzeye açık bir avlu etrafında sıralanması, ayrıca yerel duyarlılık ile taş duvar dokusu ve duvar derzleri kullanımının yanı sıra prekast beton çatı elemanları ve sövelerde brütalist bir yaklaşımın okunması vurgulanmaktadır (Ekincioğlu, 2001, 142).

Bu etkilerin gözlemlendiği üçüncü dönemde konumlandırılan Karakaş Camii, Roma İmparatoru Hadrianus'un M.S. 2. yüzyıldaki Antalya ziyaretini kutlayan Hadrianus Kapısı ile tarihi surlar ve burçların karşısına inşa edilmiştir (**Resim 7, 9**). Cansever'in tasarladığı bu caminin inşasından önce, aynı konumda Karakaş Camii olarak isimlendirilen daha eski bir



Resim 8. Karakaş Camii Planı: Demirgüç'den (2006) yeniden düzenlenerek çizilmiştir.



Resim 9. Karakaş Camii genel görünümü



Resim 10. Karakaş Camii'nde yapımı yarım bırakılan minare kaidesi



Resim 11. Karakaş Camii doğu cephesi



Resim 12. Karakaş Camii güney cephesi



Resim 13. Karakaş Camii kuzey cephesi

yapının yer aldığı bilinmektedir (Antalya K.V.K.K., 2010). Dikdörtgen plan şemasına sahip cami, sekizgen kasanak üzerine oturan merkezi bir kubbe, doğu ve batısında yer alan iki adet daha küçük çaplı kubbe ile örtülmüştür (Resim 8). Kubbelerin merkez noktasına açılan aydınlık fenerleri, hem iç mekânda hem de silüette etkili öğelerdir (Resim 15, 16). Geniş saçaklı son cemaat mahalli kuzeydedir (Resim 13). Eski caminin korunan minaresi etrafında tuğla örgüden yivli bir kılıf hedeflenmiş fakat bu fikir Antalya Kültür Varlıklarını Koruma Kurulu tarafından uygun görülmemiş projesine uygun sonuçlandırılmamıştır (Antalya K.V.K.K., 1990) (Resim 10). 20.22 x 9.53 m. ölçülerindeki harim, mihrap önünde büyük ve yüksek bir kubbeyle örtülü merkezi mekân ile iki yanında büyük kubbenin yarısı çapa sahip bu kez ikişer kubbeyle örtülü iki yan mekândan oluşmaktadır. Biri merkezi, dördü ikincil olmak üzere toplam beş kubbe ile örtülü iç mekân, mihrap duvarı kenarının diğer kenara göre uzun olduğu bir dikdörtgen plana sahiptir. İki bağımsız, diğer dördü duvarlara gömülü ayaklar merkezi kubbeyi taşımaktadır. Ayaklar arasına kuzey-güney yönde sivri kemerler atılmıştır (Resim 17, 19). Her kubbenin göbeğine, sekizgen formlu bir aydınlık feneri açılmıştır.

MİMARLIK KURAMI ÇERÇEVESİNDE CANSEVER'İN TASARIM DÜŞÜNCESİ VE ESERLERİNE ETKİLERİNİN DEĞERLENDİRİLMESİ

Cansever Tasarımlarının Düşünsel Altyapısında Öne Çıkan Kavramlar ve Tartışmalar

Cansever'in kuramsal söylemi, İslâmî ve Batılı kaynakları bütünleştirmektedir. İslâmî kaynaklar büyük ölçüde ayet ve hadislerdir. Batılı kaynaklar ise felsefede Yeni Ontoloji akımına, sanat tarihinde Ernst Diez (1878-1961) tarafından İslâm sanatını açıklamak üzere geliştirilen genetik estetik kavramına dayanır (Düzenli, 2019, 125).

Cansever'in söyleminde mimarlığın sorumlulukları İslâmî kaynaklara dayanmaktadır. Cansever, İslâm'da, Hıristiyanlıktan farklı olarak, Hz. Adem'in cennetten kovulmasının günahattan ziyade insanın çevresel bilince ulaşmasıyla ilişkilendiğini, insanın kendisinin ve çevresinin sorumluluğunu yüklenerek geleceği doğru biçimlendirebileceğini ileri sürmektedir (Cansever, 2009, 34, 50). Cansever'in mimari değerler sistemi sorumluluğa odaklı bir varlık anlayışından türemektedir (Cansever, 2009, 25-53).

Tarihsel süreçte filozoflar farklı varlık tasarımları üretmiştir (Tunalı, 2012, 21). Cansever mimarlık söyleminde Alman filozof Nicolai Hartmann'ın kurduğu Yeni Ontoloji akımının varlık tasarımı esastır (Cansever, 2009, 15). Varlığın katmanları aşağıdan yukarıya inorganik, organik, ruhsal ve tinseldir (Hartmann, 2001). Cansever, katmanları aynı sırayla maddi, biyo-sosyal, psikolojik ve ruhi-akli düzeyler olarak sunar (Cansever, 2009, 159-61). Katmanlaşmada yukarıya doğru özgürlük ve bilinç artarken fiziksel mukavemet azalır. Fiziksel özelliklere sahip maddelerden oluşan inorganik katman fizik biliminin konusudur. Tüm canlıları kapsayan organik katman biyoloji biliminin konusudur. İnsan ve hayvanları kapsayarak psikolojinin konusu olan ruhsal katmanda sınırlı bilinç ve ruhsal olgular bulunur. En üstteki tinsel katman çevreyi biçimlendirmek için üst düzeyde bilinç ve insanın kendine ve tüm varlığa dönük kavrama arayışını içerdiğinden felsefenin konusudur (Mengüşoğlu, 1976, 216-22). Cansever mimarlığı felsefe, din ve sanat ile birlikte tinsel katmana alır çünkü varlığın en üst katmanının bilincine sahip tek yaratık olarak sorumluluk üstlenen insan bilinçli mimari kararlarla çevresini düzenler (Cansever, 2009, 16-7).

Yeni Ontoloji etkisindeki Cansever, mimarlığın alt varlık katmanlarının sınırlı kavramlarıyla açıklanmasına karşıdır. Yeni Ontoloji uyarınca her varlık tabakasının özel prensipleri, kanunları olup, hiçbir tabakanın özelliği başka bir tabakanın kategorileri ile anlaşılıp açıklanamaz, dolayısıyla eski ontoloji olarak görülen Batı felsefi geleneğinin bütün dünyayı bir prensiple veya bir prensipler grubu ile açıklama çabası geçersizdir (Mengüşoğlu, 1976, 220-1). Her katman bir alttaki tarafından taşınarak onunla belirli sınırlarda örtüşür, fakat varlığa alt katmanlarda olmayan yeni kategoriler ile katılır, farklılaşarak özerk alan oluşturur ve varlığı zenginleştirir (Hartmann, 2001, 160). Bu özerklik sebebiyle üstteki katman alt katmanların kavrayış sınırlarının dışındadır. Mimarlığı varlığın en üst düzeyinde gördüğü tinsel katmanda konumlandırılan ve mimarlık bilgisinin tüm katmanları dikeyine keserek kapsadığını öne süren Cansever, mimarlığın bilimcilik ve pozitivizm sınırlarında açıklanmasına karşıdır çünkü Yeni Ontoloji'nin alt katman kategorilerinin mimarlığın açıklaması için yetersiz olduğunu düşünmektedir. (Cansever, 2009, 16,21).

Cansever, tinsel katmanda konumlandığı mimarlığın karar süreçlerinde tasarımcının inançlarının, varlık ve kendisi hakkındaki telakkisinin,

5. Cansever'in söylemindeki varoluşsal vurgu ile teknokrasi karşıtlığı Heidegger referanslarıyla oluşan Norberg-Schulz ve Pallasmaa'nın metinlerinde de ana mimarî fikirlerdir (Norberg-Schulz, 1980; Pallasmaa, 1996). Cansever'in felsefi referansı Hartmann ile çağdaş Heidegger arasında yaklaşım farklılıkları bulunur (Mengüşoğlu, 1976, 224-5). Buna rağmen mimarlığı nicel değere indirgemeye muhalif fenomenolojik yaklaşım ortak zemindir.

değerler hiyerarşisinin etkinliğini açıklamak üzere Ernst Diez'in genetik estetik kavramını kullanmaktadır. Genetik estetiğe göre sanatçının dinsel inancı kararlarını belirler. Cansever, bu bağlamda, Ernst Diez'in yanı sıra Titus Burckhardt'ın (1908-1984) İslâm sanatı konusundaki çalışmalarına da değinmektedir (Cansever, 2009, 19-35). Burckhardt, İslâm mimarisinin, diğer kültürel üretimlere kıyasla İslâm'ın ruhu ile daima uyum içinde olma ayrıcalığını daha çok taşıdığını düşünmektedir (Burckhardt, 2009, 21). Bu düşünceden hareket eden Cansever'e göre mimarlıkta İslâmî tavrı çevrenin sorumluluğunu üstlenerek onu üzerindeki tüm canlılar ile birlikte koruma bilinciyle kararlar almayı gerektirir (Cansever, 2009, 8). Buna karşın, gayri-İslâmî tutum ise çevreyi metaya indirgeyerek modern çağın teknokratik kentleşme ve yapılaşma anlayışı içerisinde çevresel kaynakları tüketmektedir (5). Mimarlıkta ana akım modernist anlayışın zaman ve yerden bağımsız, mutlak, soyut ve evrensel yapılaşma paradigmasına karşın Cansever, çevreye karşı sorumluluk üstlenen İslâmî tavrı mimarlığı zaman – zemin, bir başka deyişle tarih ve coğrafya bağlamlarına oturtarak açıklar (Tanyeli, 2001, 17). Mimarlıkta modern sonrası akımlar da genelde benzer eğilimdedir (Nesbitt, 1996). Cansever'in eserleri, zaman vurgusu dolayısıyla tarihselcilik (*historicism*), zemin vurgusu dolayısıyla da bölgeselcilik (*regionalism*) akımlarıyla ilişkili olarak tartışılmıştır (Gürer, 1997; Demirgüç, 2006; Tanyeli, 2013, 105-8).

Cansever'in Tasarımları ile İlişkilendirilen Mimarlık Akımları

Tarihselcilik ve Cansever'in Mimari Tasarımları

Kökenleri 19. yüzyıl felsefesine dayanan tarihselcilik modern sonrası mimarlık kuramının temalarındandır (Nesbitt, 1996, 40). Modern mimarlıkta tarihselcilik (*historicism*) konusundaki anlam karmaşasını gidermeyi hedefleyen Colquhoun, üç tarihselcilik yorumu sunar. Birincisi tüm sosyo-kültürel fenomenlerin tarihsel olarak belirlendiğini ve tüm gerçeklerin bağlı olduğunu savunan bir tarih kuramıdır. İkincisi geçmişin kurum ve geleneklerine ilişkin bir ilgiye işaret eden bir yaklaşımdır. Üçüncüsü ise tarihî biçimlerin kullanımını içeren bir sanatsal pratiktir (Colquhoun, 1996a, 202). Mimarlık kuramında tarihselcilik olarak Türkçe'ye çevrilen *historicism* daha çok Colquhoun'un gündeme getirdiği üçüncü yorum ile ilişkilidir çünkü mimari tasarımda tarihselcilik 19. yüzyıl canlandırıcılığında görüldüğü şekilde tarihî biçimlerin seçmeci kullanımı olarak anlaşılmaktadır (Bozdoğan, 1981, 8-10). Diğer yandan, Colquhoun bu üç yorumun örtüşmeyebileceğini düşünür (Colquhoun, 1996a, 202). Mimarlık tarihinde tarihselcilik kategorisinde değerlendirilen uygulamalar açısından incelendiğinde özellikle birinci ve üçüncü yorum arasında ciddi karşıtlık bulunur. Bir sanatsal pratik olarak 19. yüzyıl eklektisizmi tarihî kaynaklı mimari biçimlerin zamanüstü geçerlilikleri olduğu varsayımı ile çağdaş yapıların cephelerine uygulanmalarını desteklemiştir. Oysa tarih kuramı olarak tarihselcilik zamanüstü standartları reddederek tarihsel göreceliği savunur (Özlem, 2018).

Gurallar, terminolojik tartışmasında Türkçe mimarlık metinlerinin çoğunda görülen tarihselcilik yerine tarihsicilik sözcüğünü önerir. Türkçe'de -si / -sı eki müş gibi davranmayı, olmayı ya da görünmeyi ifade ettiği için uluslararası mimarlık yazınında *historicism* olarak tanımlanan ve 19. yüzyıl seçmeciliği ile temsil edilebilen yüzeysel dekor niteliğindeki tarihe göndermeli yaklaşımı Türkçe'ye tarihsici olarak çevrilebilir (Gürallar, 2015). Gurallar'ın bu önerisindeki dayanaklarından biri Atilla Yücel'in bir mimarî değerlendirmesinde tarihsellik (*historicity*) ile tarihselcilik (*historicism*) kavramlarını ayırmasıdır. Yücel, tarihî biçimlerin yüzeysel taklitlerini

üretmeleri dolayısıyla, canlandırmacı veya tarihselci eğilimleri tarihî sahtecilik olarak değerlendirmiş, bu hataya düşmek yerine tarihle ilişkiyi kapsamlı araştırmalar, kavramsal tartışmalar ve derin bir entelektüel ilgi ile kuran bir tarihselliğin mümkün olduğunu savunmuştur. Yücel, bu tür tarihsel yaklaşımın Türkiye'deki en başarılı örneği olarak Turgut Cansever'i göstermektedir (Yücel, 2007, 165-73).

Bu çalışmanın odağında bulunan Karakaş Camii, Cansever'in tarihselcilik ile ilişkilendirilmesinde önemlidir. Tanyeli, Karakaş Camii'ni gerçek ve tavizsiz bir tarihselci deneme olarak değerlendirirken bunun farklı bir tarihselci tutum olduğunu vurgular. Tanyeli'ye göre Cansever, gerisindeki modern gerçekliği gözden saklamak amacıyla tarihselliği sadece bir görüntü veya kılıf olarak kullanan konformist tarihselcilikten farklı olarak tarihî biçimleri görüntüden öteye giden, bir yandan teknik bünyeye, öte yandan onu var eden toplumun üretim ve yaşama biçimlerine ilişkin bir duyarlılık ve derinlik ile yorumlar (Tanyeli, 2013, 105). Burada Tanyeli tarihselciliğin daha geniş bir tanımıyla tarihî biçimlerin yüzeysel taklitleri üzerinden işleyen anlayışı bir tür ana akım tarihselcilik olarak görmekte ve Cansever'in bu anlayıştan farklılaştığını vurgulamaktadır. Buna karşın Gürallar'ın da belirttiği gibi tarihselciliğin mimarlıkta yüzeysel dekor niteliğindeki tarihe göndermeli yaklaşımını niteleyen yerleşmiş bir anlamı vardır. Yücel'in Cansever ile ilgili değerlendirmesi de bu kabulden hareket eder.

Bu çalışmada Cansever'in eserleri tarihselcilik ile ilişkili olarak tartışılmış olsa da tarihselci olarak sınıflandırılmamıştır. Yücel ve Tanyeli'nin farklı tarihselcilik tanımlamalarına karşın vardıkları ortak sonuç herhangi bir sınıflandırma yapmaktan daha önemli görünmektedir: Cansever, eserlerinde tarihî biçimleri entelektüel bir derinlik ve özgün bir yaklaşım ile yorumlamıştır. Cansever'in tarihsel biçimlere farklı düzeylerde atf yapan tasarımları bu yorumları yansıtır. Örneğin mimarın ilk döneminin temsilcisi olan Anadolu Kulübü'nde (1951-1957) (**Resim 1**) yerli bir duyarlılık ile Modern düşüncenin bütünleştirildiği görülür (Tanyeli, 2001, 20). Modernist mimari dil cephelerde geleneksel öğelerin yorumları olan güneş kırıcılar ve ahşap kafesler ile birlikte ele alınır fakat söz konusu cephe elemanları sadece yüzeyde yer alan tarihsel göndermeler olmayıp çevresel koşullara duyarlılığı temsil eden, mekânsal derinlik ve iklimsel konfora ilişkin işlevsel öğelerdir. Cansever'in ikinci döneminin temsilcisi olan Türk Tarih Kurumu'nda (**Resim 3, 4**) ise tarihsel biçimlere doğrudan atıflar bulunmamakla birlikte avlulu plan şeması Selçuklu ve Osmanlı medreselerindeki ana fikrin çağdaş yorumudur. Cansever'in geç dönem eserlerinden olan Sualtı Arkeoloji Enstitüsü (**Resim 6**) ve Karakaş Camii'nde (**Resim 11, 12**) tonoz, kubbe ve aydınlık fenerleri gibi geleneksel biçimler doğrudan kullanılmış olsa da amaçlanan yüzeysel dekor değildir. Bu öğeler, kullanıcının üç boyutlu deneyiminde anlam kazanarak mekânda iklimsel konforu da sağlamaktadır. Bu durum, mimarlıkta bölgeselcilik düşüncesinin de bir yansıması olarak görülebilir.

Bölgeselcilik ve Cansever'in Mimari Tasarımları

Mimarlıkta bölgeselcilik yerel iklim, topoğrafya, kültür, yöresel malzeme ve tekniklere yönelik duyarlılığı içerir (Demirgüç, 2006, 3). Bölgeselcilik rasyonel ve evrenselleştirici modernist eğilime karşıt olarak hayata duyuşsal bir fiziksellik ve derinlik katmayı hedefler (Buchanan, 1983, 15). Mimarlıkta bölgeselciliği anlayabilmek için onu bölgesel mimarlıktan ayırt etmek gerekir. Lefavre ve Tzonis belirli bir yerel ve kültürel bağlam ile ilişkili bölgesel mimarlık fikrinin kökenlerini antik çağa dayandırmaktadır

(2003, 11). Buna karşın, sosyal bilimlerden kaynaklanan bölgeselcilik kavramının mimari tasarımda bilinçli bir yaklaşım olarak tartışılmaya başlaması 20. yüzyılın başlarına tarihlenebilir (Erkılıç, 1998, 6). Canizaro, her bölgeselci yaklaşımın yerel farklılaşmayı yok eden standartlaşmaya karşı direnç oluşturan bir kuram oluşturduğunu ve bölgeye özgü yaşamın yeniden kurulması için alternatif yöntemler önerdiğini vurgulamaktadır (Canizaro, 2007). Söz konusu kuramsal zemin bölgeselci mimarlığı bölgesel mimarlıktan ayırır (Pavlidis, 1991). İlkinde yerel koşullara duyarlılık kuramsal dayanakları olan bilinçli bir tercih iken ikincisinde çevreye uyum zorunluluktur (Canizaro, 2007, 20-1).

Mimarlık kuramında bölgeselcilik, modern ve modern sonrası dönemlerde süreklilik göstermiştir (Canizaro, 2007) Ana akım modernizmi evrenselci bir üslup olarak kuramsallaştıran 1932 tarihli MoMA sergisine katılan Corbusier, Wright ve Neutra gibi mimarların tasarımlarında bile bölgeselci duyarlılıklardan söz edilir. 1920'lerin sonlarından itibaren Corbusier'nin vernaküler ve yöresel yapılara ilgisi artmıştır (Colquhoun, 1996b). Kübik biçim, beyaz duvarlar gibi Akdeniz vernakülerinin özellikleri Corbusier'nin 1930'lu yıllardaki endüstriyel standardizasyon fikri kadar önemli olmuştur (Colquhoun, 1997, 14). Wright'ın Orta Batı A.B.D. bağlamında geçerliliğini savunduğu prairie evleri de bölgesel koşullara duyarlıdır (Speck, 1987). Neutra da benzer şekilde modernist dili, A.B.D.'nin batı kıyısına özgü sosyo-kültürel ve doğal koşullar içerisinde yorumlamıştır (Drexler, Hines, 1982, 6). Aynı dönemde evrenselcilik ve tekno-ütopyacığa şüpheyle yaklaşan Aalto ise vernaküler mimarlık geleneklerini yer ve zamana bağlılığı içerisinde modern bir dil ile yorumlayarak ana akım modern hareketten ayrılır (Pallasmaa, 1988). Mimarlıkta ana akım modernizmin geçmişe ve yerel geleneklere duyarsızlığına karşı gelişen tepkiler sonucunda bölgeselcilik, 1940'lı yıllardan itibaren daha belirginleşerek 60'lı yıllarda gündeme oturmuş ve modern sonrası düşünce içerisinde özellikle 70'li ve 80'li yıllarda öne çıkan yaklaşımlardan biri olmuştur. Bu gelişimi boyunca bölgeselcilik evrensel ile bölgesel arasındaki kavramsal karşıtlığı modern mimarlığın önemli bir problem alanı haline getirmiştir. Mimarlıkta bölgeselcilik, herhangi tekil bir yaklaşımın baskın olamadığı modern sonrası dönemin çoğulcu düşünce iklimi içerisinde farklı yorumları ile halen geçerlidir. Dolayısıyla, bölgeselcilik yekpare bir kuram veya uygulama sahasına işaret etmeyip daha çok küresel ile yerel veya modernite ile gelenek arasındaki gerilim hatlarında çözümler üreten birçok farklı yaklaşımın genel adıdır (Canizaro, 2007, 16). Burada ortak temalar standart biçimlere direnç, evrensel ile yerel arasında denge arayışı, kültürel kimliğe ve yere özgüleşme hassasiyet ve insanlar ile yaşadıkları coğrafyanın kültürü, tarihi, kimliği ve ekolojisi arasında bağ kurma arayışlarıdır (Canizaro, 2007, 21).

Dolayısıyla, bölgeselcilik, modernizm içerisindeki uluslararasılık (*internationalism*) düşüncesine tepki olarak gelişen ve içerisinde vernaküler geleneklerin doğrudan aktarımından bu geleneklerin çağdaş malzeme ve teknikler ile yorumuna kadar değişen geniş yelpazede yaklaşımları barındıran bir düşünce sistemidir. Mimari mirasa biçimsel göndermeler taşıyan bir sahne dekoru yüzeyselliğinden özgün mekânsal deneyime kadar değişen karşılıklar bulunabilir (Özkan, 1989). Özkan'ın sunduğu yaklaşımlar yelpazesinde uç durum olan sahne dekoru yüzeyselliği Gürallar'ın (2015) mimarlıkta yüzeysel dekor niteliğindeki tarihe göndermeli anlayış olarak tanımladığı tarihselcilik ile örtüşür. Cansever'in tasarım düşüncesinin ise bu tür bir bölgeselcilik ile örtüşmediği açıktır. Fakat genelde Cansever bölgeselciliğin bir temsilcisi olarak görülmektedir

(Evyapan, 1991). Dolayısıyla Cansever'in bölgeselciliğin hangi yorumuna dahil olduğunu tespit etmek gerekir.

Özkan, bölgeselciliği vernacularism ve modern regionalism başlıkları ile ikiye ayırarak incelemekte ve modern bölgeselciliği modernizm ile bölgeselciliğin ara kesitinde bir yaklaşım olarak tanımlamaktadır. Bu görüş kapsamında, yapı malzemelerine içkin niteliklere saygı, taşıyıcı sistemin açıkça ifadesi, biçimlerin işlevsel meşruiyetleri söz konusu ara kesitte hem modernizm hem de bölgeselciliğin ortak ilkeleridir. Özkan'a göre bölgeselci bir yaklaşım geliştirmeyi dileyen bir mimar, modernizmin yukarıda sayılan ilkeleri ile bir sorun yaşamaz fakat anlam ve içeriği belirli bir yöresel durumda arayan bölgeselci mimar için modernizmin kabul edilemez ilkesi malzeme ve tekniklerde evrensellik gözeten uluslararasılıktır. Dolayısıyla asıl karşıtlık bölgeselcilik – modernizm değil bölgeselcilik – uluslararasılık eksenindedir (Özkan, 1989, 8). Yücel'in (2007, 172) en ciddi Türk modernisti olarak nitelendirdiği Cansever'in bölgeselci yorumu Özkan'ın modern bölgeselcilik olarak tanımladığı uluslararasılığa karşıt bir çerçeveye oturmaktadır.

CANSEVER'İN TASARIM DÜŞÜNÇESİNİN KARAKAŞ CAMİİ TASARIM KARARLARINA ETKİLERİ ÜZERİNE BİR ÇÖZÜMLEME

Tarihselcilik Tartışması Bağlamında Tasarım Kararları: Plan ve Kütle Organizasyonu

Cansever, Karakaş Camii'nin plan organizasyonuna bilinçli bir karar olarak değinerek yakın ve uzak tarihimizde kullanılmış bulunan bir plan şemasını tekrarladığını vurgulamıştır (Cansever, 2004). Yapı, Cumhuriyet Dönemi camilerinin büyük çoğunluğunun dayandığı, Şehzade Camii'nin temsilcisi olduğu, Klasik Osmanlı Dönemi merkezi plan şemasını takip etmemektedir. Bunun yerine Beylikler veya Erken Osmanlı Dönemi Mimarisi esas alınmıştır. Büyük mihrap önü kubbesi ile örtülmüş ana mekânın yanlara doğru ikincil öğeler ile genişlediği plan şeması Karahanlılar gibi Orta Asya'nın erken Türk-İslâm medeniyetlerinden başlayarak Selçuklu, Beylikler ve Osmanlı dönemleri boyunca Anadolu-Türk mimarisine aktarılan bir gelenektir (Hillenbrand, 2005). Planda Klasik Dönem öncesi Osmanlı camilerinden, özellikle Edirne Üç Şerefeli Camii'den (1437-1447) etkiler görülmektedir. Cumhuriyet Dönemi'ndeki genel eğilimin tersine Beylikler ve Erken Osmanlı dönemlerini anımsatan plan şemasının (**Resim 8**) bilinçli kullanımı dikkat çekicidir.

Cansever, Türk-İslâm mimarisinde Karahanlılar'dan Mimar Sinan Dönemi'ne doğru tutarlı bir şekilde uzanarak merkezi kubbenin giderek büyümesi ve yapıya hâkim olmasıyla Edirne Selimiye Camii'nde zirve noktasına ulaştığı düşünülen doğrusal ve kronolojik gelişme çizgisine karşı çıkmakta böyle bir gelişimin olmadığını savunmaktadır (Can ve Doğan, 2017, 108). Mimarın bu karşı çıkışı söyleminin düşünsel altyapısıyla tutarlıdır çünkü bu kronolojik gelişmenin kabulü mimarlık tarihini teknolojik gelişime indirger. Cansever'in yaklaşımı tarihî perspektif içerisinde ortaya koyduğu özgün İslâm Mimarisi tanımına dayanır. Cansever, İslâm mimarisi çerçevesine aldığı tarihî mirasın İslâm inancından kaynaklanan evrensel ilkelere dayandığını ve İslâmî kavram ve temaların farklı tarihî ve coğrafi bağlamlarda, kendi deyişiyle zaman-zeminlerde kristalleşerek farklı üslupsal açılımlar sergilediğini öne sürer (Cansever, 2010a, 11-3). Bu açılımlar doğrusal bir modele hapsedilemeyecek kadar çeşitli, çok yönlü ve zengindir. Dolayısıyla, İslâm mimarisinin belirli bir

tarihî dönem veya coğrafi bağlamında üretilmiş bir yapının diğerlerine göre hiyerarşik üstünlüğü olduğunu düşünmemiştir.

Tarih yazımı yaklaşımları geçmişte organize etmenin yöntemlerini aramakta, bu hedef doğrultusunda tarihî bulguları belirli ölçütlere göre ilişkilendirmektedir (Arnold, 2004; Leach, 2010). Cansever'e göre mimarlığın tarihî verilerini teknolojik gelişimi esas alan bir kronolojik çizgi etrafında organize ederek açıklama ve meşrulaştırma çabası söz konusu yapıların çok yönlü zenginliğini kavramayı engelleyen indirgemeci bir yaklaşımdır. (Cansever, 1997, 43-5). Teknolojik gelişimi tek başına bir meşrulaştırıcı ölçüt olarak kabul etmek varlığı Yeni Ontoloji düşüncesindeki en alt katmanı ile sınırlandırmak ile eşdeğerdir. Mimarlık sadece nicel büyüklüklerin değerlendirildiği fizik ile açıklanamaz. Tüm varlık katmanları ile ilişkili olsa da insana özgü bir disiplin olarak mimarlığın meşrulaştırıcı çerçevesi felsefe, din ve ahlak alanlarının da geçerli olduğu en üstteki tinsel katmandadır. Varlık katmanlarının en üst seviyesindeki tinsel varlık alanına ait olan mimarlık daha alt seviyelerin bilgisi olan teknolojinin sınırları içerisinde açıklanamaz.

Cansever, Türk-İslâm mimarisindeki gelişimci modelden önce Batı'da bu modelin öncülü olarak ortaya çıkan yaklaşımları eleştirmekte, Bannister Fletcher'ın mimarlık tarihi kitabının 1970'lere kadar İngiltere'deki mimarlık okullarında okutulmasını olumsuz bir durum olarak değerlendirmektedir (Cansever, 2009, 40). Fletcher, Batı mimarlık tarihini kendi içinde tutarlı bir gelişim içerisinde görerek kayda değer mimarlık için meşrulaştırıcı ölçütü teknolojik gelişme ile sınırlandırmıştır. Ölçüt bu şekilde belirlendiğinde, Antik Çağ'dan Endüstri Devrimi'ne ve Modern Hareket'e kadar uzanan Batı mimarlığı teknolojik başarılarla ulaşması sebebiyle tarihsel, Batı dışında kalan kültürlerin mimarlıkları ise tarih dışı ve durağan olarak değerlendirilmiştir. Bu çerçevede, Müslüman toplumların mimarlık mirasları teknolojik ve strüktürel gelişimden uzak, daha çok süsleme sanatlarına dayalı durağan bir mimari kültürün temsilcileri olarak görülmüştür (Fletcher, 1905).

Batı dışı ülkelerin çoğunda araştırmacıların Batı'da icat edilmiş olan İslâm Sanatı / Mimarisi yaklaşımını yeterli düzeyde sorgulamadan kabul ettikleri görülse de Türkiye'de Erken Cumhuriyet Dönemi aydınları tarihte rasyonel ve teknolojik gelişimin Batı ile sınırlı olduğu ve Türklerin tarihte kendilerine özgü bir sanat geliştiremediklerine dair Batılı tezlere karşı çıkmışlardır (6). Bu bağlamda Türk Sanatı ve Mimarisi'nin Batılıların icat ettiği İslâm Sanatı içerisinde tanımlanamayacak kadar özgün değerlere sahip olduğu, rasyonel ve teknolojik gelişimin ve pozitivist düşüncenin Türk Mimarisi'nin tarihi içerisinde de mevcut olduğu savunulmuştur (7). Orta Asya'dan Anadolu'ya uzanan tarihî süreçte kendi içinde tutarlı ve rasyonel bir gelişimin nicel ve teknolojik ölçütler ile ortaya konabildiği düşüncesi Cumhuriyet Öncesi Türk Mimarlığı'nın zirve noktası olarak görülen Mimar Sinan Dönemi'ne önem kazandırmıştır. Mimar Sinan eserlerinin Klasik Osmanlı Mimarlığı başlığı ile bir mimarlık tarihi dönemi olarak ortaya konması ile birlikte Mimar Sinan bireysel yetenekleri açısından İtalyan Rönesans sanatçıları ile çağdaş ve onlar ile eşdeğer bir deha olarak yorumlanmıştır (Aslanapa, 2007, 251). Mimar Sinan'ın *Tezkiret-ül Bünyân*'da sözünü ettiği çıraklık, kalfalık ve ustalık dönemleri ile örtüşecek şekilde mimarın kariyerinde Edirne Selimiye Camii'nde zirveye ulaşan doğrusal bir gelişim olduğu düşüncesi gelişerek günümüze kadar yaygınlığını korumuştur. Örneğin Günay, Mimar Sinan tasarımlarını gelişimci bir çizgiye oturtulan strüktürel şemalarına göre

6. Kuban (2010, 6), Türkiye'de ulusal bir tarih yazımı ve ona bağlı bir kültür ve sanat tarihi yazımının Osmanlı'nın son dönemlerinde başladığını fakat bilinçli bir faaliyet olarak Cumhuriyet Dönemi'nde kurumsallaştığını ifade etmektedir. Tanyeli (1991) de tarihî perspektifte İslâm Mimarlığını Batı'da icat edilen bir kavram olarak sunmakta ve Cumhuriyet Dönemi'nde bu kavrama tepki olarak ortaya çıkan tarih yazımı yaklaşımlarını tartışmaktadır.

7. Mülayim (2004), Erken Cumhuriyet Dönemi'nden itibaren camiler bağlamında Selçuklu – Beylikler – Osmanlı sürekliliğinde mimari plan/kütle tipolojisine dayalı bir gelişme şemasının tespit edilip vurgulandığını ifade eder. Erken bir gelişimi Celal Esat Arseven'in kitabında görülen Türk Sanatı, Ernst Diez'in İran ve Orta Asya'da tespit ettiği bulgular ile daha da zenginleşmiştir. Diez'in öğrencisi Oktay Aslanapa'nın (2007) son halini verdiği Türk Sanatı adlı kitapta kendine özgü tarihî gelişimi ile başka milletlerin mimarisinden açık ve seçik bir şekilde farklılaşan Türk Sanatı düşüncesi ortaya konmaktadır.

8. Arnold (2004) tarihyazımı sürecinde dağınık bilgileri tutarlı bir omurgaya bağlayan kurgusal öğenin (*fictional element*) etkinliğini tartışmaktadır.

9. Aslanapa'ya göre Şehzade Camii ile Mimar Sinan yarım kubbe problemini ilk defa ele almış, Ayasofya ve Beyazıt Camii'ni aşarak dört yarım kubbeli ideal bir merkezi yapı meydana getirip Rönesans mimarlarının rüyasını gerçekleştirmiştir (Aslanapa, 2007, 253)

(dört dayanaklı tek kubbeli, dört dayanaklı yarım kubbeli, altı dayanaklı, sekiz dayanaklı) tasnif ederek sunmaktadır (Günay, 2014). Saatçi de Mimar Sinan'ın hedefinin tek kubbe altında mekân birliğini sağlamak olarak tanımlanabilecek mimarlık idealinin finali olduğunu, bir strüktürel zafer olan Selimiye Camii'nin kendinden sonra gelecek mimarlara da yapacak pek bir şey bırakmadığını düşünmektedir (Saatçi, 2013). Benzer değerlendirmeler Mülayim ve Aslanapa tarafından da yapılmaktadır (Mülayim, 2004, 84-90; Aslanapa, 2007, 261-3).

Cansever'in perspektifinden, teknolojik gelişmeyi tarihyazımının temel kurgusal öğesi (8) kabul ederek Batı merkezli bir tarihsel anlatı kuran Fletcher, ne kadar hatalı ise bu Batılı kurguya karşı çıktığı halde aynı kurgusal öğeyi uyarlayarak Türk-İslâm Mimarisi tarihini Mimar Sinan'ın Edirne Selimiye Camii'nde zirveye ulaştıran bir teknolojik gelişim etrafında kurgulayan yaklaşım da o kadar hatalıdır. Her ikisi de Yeni Ontoloji'nin katmanlı varlık düşüncesinin tinsel katmanına ait olan, tasarımcının inanç evreninin bir yansıması olarak çok yönlü bir zenginliğe sahip mimarlık yapıtını nicel tanımlamalar ile sınırlı teknik bir sonuca indirgemektedir. Cansever'in Yeni Ontoloji akımına dayanan tarihsel okuması, Türk-İslâm mimarisini incelerken gelişimci kurguyu reddetmesinin ardındaki temel gerekçedir. Cansever, Sinan'ın eserlerini alışıldık şekilde strüktürel şemaya dayalı kategoriler üzerinden değil, farklı strüktürel şemaların ardı ardına gündeme geldiği kronolojik bir dizi halinde incelemekte ve yapıtları İslâm mimarisi kavramları açısından çözümlemektedir (Cansever, 2010a). Tarihî gelişimde teleolojik bir boyut aramaya alışık okuyucu için Cansever'in metni anlamsızlaşmaktadır. Fakat bu Cansever açısından problem teşkil etmez, çünkü onun felsefî kabulleri mimarlık tarihinin ardında gelişimci bir ereksellik öngörmez, onun yerine mimari yapıtları zamanüstü ve evrensel olduğunu düşündüğü kavramlar açısından değerlendirir.

Bu kuramsal çerçevede, Mimar Sinan'ın uzun bir kariyere ve farklı kentsel ve coğrafi bağlamlara yayılan yapıtlarını bir teknolojik gelişme çizgisine oturtarak incelemek yerine İslâm mimarisinin genetik estetiğine özgü tasarım anlayışının farklı zemin ve zamanlardaki açılımlarını sergileyen mekânsal somutlaşmalar olarak görmek gerekir. İslâm mimarisine dair bu tarihî perspektif, Cansever'in tarihselci yaklaşımında zengin bir biçim repertuarına sahip olmasına imkân tanımaktadır. Bir başka deyişle, dört dayanaklı yarım kubbeli plan şemasının merkezi kurgu açısından en kararlı ve dengeli örneği olarak görülen Şehzade Camii, Cansever için mutlak bir tarihî referans değerine sahip değildir. Oysa Cumhuriyet Dönemi'ndeki cami mimarlığında söz konusu şema gelişimin zirvesi olarak kabul gören Klasik Osmanlı mimarisinin temsilcilerinden biri olarak sıklıkla tekrarlanmıştır (9). Buna karşın Şehzade Camii şemasının nihâî nokta olduğunu sorgulayan görüşler bulunur (Peker, 2013, 260). Karakaş Camii'nin ilham kaynaklarından Edirne Üç Şerefeli Camii tipolojik gelişimci şemanın zirve noktası değildir. Bu yapı zirveye giden yolda bir atılım, bir hazırlık olarak görülmüştür (Aslanapa, 2017, 234-7). Yaygın görüşü eleştirerek Türk-İslâm mimarisinde herhangi bir tarihî zirve görmeyen Cansever, bu sayede sıra dışı bir tavır ile Beylikler Dönemi'ni veya Erken Osmanlı Dönemi'ni hatırlatan bir plan şemasını özgürce tekrarlayabilmektedir (Can ve Doğan, 2017, 108), (Resim 8).

Bölgeselcilik Tartışması Bağlamında Tasarım Kararları: Ölçek, Malzeme ve Teknik

“Cami yaptırma derneğinin başında çok muhterem bir emekli general bulunuyordu. Onunla konuları görüşürken, kendilerinin bu caminin

güzel ve nizami olması için en kıymetli, ne kadar pahalı olursa olsun, en değerli taşlardan bu caminin inşa edilmesini istediklerini, keza bu taşların olabildiğince, karşıdaki kale duvarının taşları gibi, iri ve gösterişli olmasını istediklerini ortaya koymaları üzerine, kendileriyle çok uzun sohbetlerimiz sonunda böyle bir tavırla değil fakat azla yetinmenin yüceliğinden yararlanmak, küçüğün güzel olduğunun idrakinden hareket etmek ve Kaleiçi Antalyası'nda, evlerin bahçe duvarlarında, gayrimuntazam taşların aralarında beyaz harç içerisinde renkli taşlar, renkli kiremitlerle meydana getirilmiş duvarların ilişkiler sisteminin büyük şiirselliği ve o şiirsellikle beraber orada varolan küçüğün güzelliğinde tatmin olmak, ona razı olmak, rızanın, hakikatin yüceliğinin, takvanın, velhasıl yanlış yapmamak yoluyla elde edilecek bir doğrular güzelliğinin, ihlasın, zühdün, önemi üzerinde yaptığımız görüşmeler sonunda camiye karşı taraftaki burçlar karşısında katiyen küçük düşmeyen, gerekli yücelik hislerine sahip olan bir mimariye ulaştırdık" (Cansever, 2004).



Resim 14. Karakaş Camii harim içi genel görünüm



Resim 15. Karakaş Camii merkezi kubbesi

Cansever'in Karakaş Camii tasarımına dair anlatımlarında ölçek ve malzeme ile ilgili tercihlerini Kaleiçi geleneksel sivil mimarisine ve dokusuna dayandırması, kubbe kaplamaları ve fenerlerin kullanımının iklimsel faktörler ile ilişkisini vurgulaması zemin boyutunu, dolayısıyla bölgeselci yaklaşımı gündeme getirir (Cansever, 2010c) (Resim 14, 20). Cansever'in tasarım kararlarının dayandığı zaman ve zemin tanımları bir nedensellik ilişkisiyle birbirine bağlıdır. Cansever, kendi deyimleriyle, yeni bir plan şeması geliştirmek yerine tarihimizde varolan bir planı tekrarlar (Cansever, 2004) zaman ölçeğinden hangi plan şemasını seçeceği zemin ile ilgili yorumlamaları ile belirlenmektedir (Cansever, 2010b).

Cansever'in cami işlevini yorumlarken ölçek tercihi de sıra dışıdır. Yapının çevresiyle kurduğu ilişki, oranlar, teknik ve malzeme konuları göz önüne alındığında, bu hususlardaki kararlarında fiziksel büyüklük, anıtsal ölçek gibi ölçütlere önem verilmeyip tevazu ve zühd kavramlarından



Resim 16. Karakaş Camii güneybatı köşedeki kubbe görünümü



Resim 17. Karakaş Camii mihrap duvarı

etkilenildiği görülmektedir. Zühd “bir şeye rağbet etmemek, ona karşı ilgisiz davranmak, ondan yüz çevirmek” gibi anlamlara gelir. Zühd kavramı “genellikle dünyaya karşı olumsuz tavır ve davranışların bütününe ifade eder”. Bu kavramın bazı göstergeleri olarak “dünya malına, makama, mevkiye, şan ve şöhrete önem vermeme; azla yetinme, çokça ibadet etme, ahiret için hayırlı işlere yönelme” gibi tutumlar vurgulanır (Ceyhan, 2013, 530-33).

Cansever’e göre cami zor bir bağlama oturmaktadır. Karşıda anıtsallığı, niteliği ve sembolik gücüyle Hadrianus Kapısı ve yanlarında iki yüksek kale burcu ve kale duvarları bulunurken iki yanda 7-8 katlı beyaz, betonarme, ruhsuz binalar vardır (Cansever, 2004). Tasarlanan caminin yolun karşısındaki Roma anıtı ve anıtsal burçlar karşısında ezilmemesi beklenmekteydi. Mimar bu sorunu çözmek için biçimsel büyüklüğü reddederek, azla yetinmeyi ve küçüğün güzelliğinden hareket etmeyi tercih eder (Taşar, 2019, 49). Komşu yapılar ile yarışmak yerine, surların ötesindeki Kaleiçi geleneksel dokusuyla düşünsel bir ilişki kurarak, oradaki bahçe duvarlarının zengin dokusunu proje arazisinde sürdürmeyi hedefleyerek projeyi bu doğrultuda yönlendirmiştir (Cansever, 2004). Cansever’in mimari yaklaşımında yücelik, fiziksel büyüklük değil, seçilen malzeme ve yapı sistemi ile mekân kurgusunun iç tutarlılığı, dengeli oran-orantı ilişkileri, teknik mükemmeliyet, insan ölçeğiyle kurduğu doğru ilişkiler ve çevresel uyum ile ilgilidir. Tasarımlarını daima güçlü bir felsefi zemin üzerinde geliştirmeye çalışan Cansever, mimarının bu değerler ile şiirsel özelliklere ve asaletle sahip olacağını savunur (Cansever, 2010b, 171-6; Aman, 2018).

Cansever’in ölçek, malzeme ve teknik konularındaki tasarım kararları İslâm mimarisi ve Hıristiyan mimarisi arasında tanımladığı karşıtlık ile doğrudan ilişkilidir. Cansever, Pagan Roma Uygarlığı’nın imparatoru tanırlaştırma çabasının ürünü olarak gördüğü anıtsal ölçeğin sonraki inanç değişimine rağmen Hıristiyan mimarisinin tüm dönemlerinde sürdüğünü düşünür (Cansever, 2009, 26, 34). Bu nedenle Cansever, karşısında yer aldığı Hadrianus Kapısı ve burçların anıtsal ölçeği ile nicel bir yarış içerisine girmeyi reddederek tasarımın bağlamını burçları aşan daha geniş bir kentsel kesitten okumuştur. Bu çerçevede, Cansever’in nicel büyüklük ihtirasını İslâmî bir kavram olan şirk ile özdeşleştirilmesi de Karakaş Camii tasarım kararlarını belirleyici bir etken olarak görülmelidir (Cansever, 2009, 38). Cansever, Karakaş Camii’ndeki tasarım kararlarını açıklarken küçüğün büyüklüğü, zühd, aza razı olmak kavramlarını burçların ardındaki Kaleiçi dokusu ile ilişkilendirmektedir (Cansever, 2004). Bu ilişki, Cansever’in İslâm Mimarisi kavramına yüklediği anlamlar ile örtüşmektedir (10).

Cansever’in malzeme ve teknik ile ilgili yaklaşımında, gayri muntazamlığa ve küçüğün güzelliğine yaptığı vurgu, caminin dış cephelerinde karşılaşılan düzensiz çerçeve tekniğiyle örülmüş duvarlarında somutlaşmaktadır (**Resim 21**). Bu bağlamda da Klasik Osmanlı Dönemi öncesine özgü mimari özelliklerden ilham alındığı görülmektedir. Erzen’e (1996) göre duyumsal bir estetik ifadenin maddi kültür verilerine yansımada, Ortaçağ özgün bir konuma sahip olup örneğin Bursa’nın Erken Osmanlı Dönemi bu duyarlılığı başarı ile temsil etmektedir (Erzen, 2006, 10-1). Erzen, Batı’da Ortaçağ – Yeniçağ dönüşümünde estetik değerleri oluşturan ilişkilerde bir değişim gerçekleştiğini tespit eder. Bu değişim bir karşıtlık oluşturmuştur. Bu karşıtlık Rönesans öncesi Batı resminde ve Osmanlı minyatür sanatında ifadesini bulan özne – nesne bütünlüğüne karşı öznenin dünyayı dışarıdan izleyerek nesne haline

10. İslâmî düşüncede anıtsallık ürünün büyüklüğü üzerinden değil hakikatin büyüklüğü üzerinden ifade edilir (Sözeri, 2013, 195) Cansever de Osmanlı mimarisinin başarısını Ayasofya’nın kubbesini geçmek gibi nicel bir ölçüte bağlamaz, İslâm mimarisinde ölçek konusunu değerlendirirken İslâm dünyasındaki yapıların hiçbir zaman büyüklükle yüce olmadığını, Süleymaniye Camii’nin, Roma’daki St. Pietro Kilisesi’nin yarısı kadar yükseklikte olmasına rağmen St. Pietro ile kıyas edilemeyecek kadar heyecan verici, saygı uyandırıcı, yüce bir yapı olduğunu, İslâm mimarisinde büyüklüğün mutlak değil nispi, bir başka deyişle bağli ve bağlama özgü olduğunu savunmaktadır (Can ve Doğan, 2017, 112-3).

11. Erzen çizgisel perspektifin gelişimini Batıda nesnellüğün gelişmesinin görsel kanıtı olarak yorumlamakta perspektifin Batıda görme biçimleri üzerinde yalnızca yeni bir bilinçliliğe yol açmakla kalmadığını, insanın kendini, seyrettiği dünyanın dışında tutmasının bir ifadesi ve algıladığı mekânın sınıflandırılması ve kontrolü için bir yöntem olduğunu vurgulamaktadır (2006, 10-1; 1996, 25). Batı'da perspektifi bir çizim yönteminin ötesinde belirli bir bilinç düzeyi ve felsefi kavrayışın yansıması olarak gören detaylı bir tartışma için: Bkz. Panofsky, 2013.

getirdiği Rönesans perspektifi ile temsil edilir (11). Ortaçağ estetiğinin yansıması olan Selçuklu, Beylikler ve Erken Osmanlı Dönemi mimarisinin örnekleri klasik bir düzen arayışına ve arı bir biçimlenmeye karşın, yumuşak çizgilerin, hafif eğim ve eğrilerin dik açılara, sert dönüşlere tercih edilmesi, topografyanın yapılaşma düzenine hâkim kılınmasını yansıtmaktadır (Erzen, 2006, 11).

Ortaçağ estetiği ile klasik düzen ve disiplin arasındaki karşıtlık Karakaş Camii'nin tasarım kararları ve özellikle de plan şeması seçimi için açıklayıcıdır. Proje için zemini oluşturan Antalya, Cansever'in gözünden Kaleiçi evlerinin... ilişkiler sisteminin büyük şiirselliğini,... küçüğün güzelliğini dolayısıyla zühd kavramını çağırır (Cansever, 2004). Plan şemasının referansını oluşturan zaman dilimi, Cumhuriyet Dönemi cami mimarisinin çoğu örneğinin dayanağını oluşturan 16. yüzyıl Klasik Osmanlı mimarisinin anıtsal büyüklükler üreten şeması değil, Kaleiçi Antalyası'nın (Resim 20) insan ölçeğine ve algılarına hitap eden,

Resim 18. Karakaş Camii harim içi seramiklerden detay



Resim 19. Karakaş Camii harim içi kuzey duvanı





Resim 20. Kaleiçi sivil mimarlık örnekleri



Resim 21. Karakaş Camii düzensiz çerçevesi teknikte örülmüş duvar detayı

Ortaçağ estetiğinin karakterini somutlaştıran Beylikler ve Erken Osmanlı dönemleridir (Resim 14, 15, 18). Karakaş Camii'nin ilham kaynağını oluşturan tarihî yapıların Cansever'in kuramsal söylemi çerçevesinde incelenmesi sonucunda, Karakaş Camii projesinde kendi içinde tutarlı, mimari geleneklerden bilinçli bir şekilde ilham alarak dönemsel referanslarını bu sistematik içerisinde oluşturan, yüceliği biçimsel büyüklükten ziyade çevre ile bütünleşme ve insan ölçeğinde arayan, dolayısıyla komşuluğundaki anıtsal ölçek karşısında ezilmeyen nitelikli bir mimari eser ortaya konduğu görülmektedir.

SONUÇ VE DEĞERLENDİRME

Felsefe alanında Yeni Ontolojinin katmanlı varlık tasarımı ile sanat tarihi alanında genetik estetiğe dayalı inançların belirleyiciliği düşüncesinin Cansever'in mimarlık söyleminin ana çerçevesini çizdiği görülmektedir.

12. Tarihi biçimlere benzerlikleri çarpıcı bulan Tanyeli uzman olmayan bir gözün yapıyı bir on dördüncü yüzyıl Beylikler Dönemi camisi olarak değerlendirebileceğini ifade eder Tanyeli (2008).

13. Mimarlar Odası Antalya Şubesi ve Antalya – Kepez Belediyesi 2015 yılından itibaren Turgut Cansever Mimarlık Ödülleri adı ile yarışmalar düzenlemektedir. 2019 yılında organizasyon uluslararası nitelik kazanmıştır. Değerlendirme ölçütleri Cansever'in mimari yaklaşımlarını esas almaktadır (Mimarlar Odası Antalya Şubesi, 2020).

Karakaş Camii tasarım kararları bu söylemin etkisindedir. Karakaş Camii Cumhuriyet Dönemi cami mimarisi içerisinde özgün niteliklere sahip bir yapıdır (Divleli, 2013). Cumhuriyet Dönemi cami mimarisinde Klasik Osmanlı şemalarının, bağlamlarından kopartılarak ve özgün oran ve biçimlerinin bozularak taklit edilmesine dayalı genel bir niteliksizlik olduğu kaydedilir (Kuban, 2013). Cansever bu düşünceyi paylaşır (Can ve Doğan, 2017, 110). Karakaş Camii örneğinde de tarihi biçimlerin tekrarlandığı gözlenir (12) fakat tekrarlanan yapı oranları, silüet, plan tipolojisi, yapı malzeme ve teknikleri tarihi örnekleri hassasiyet ile takip eden bilinçli bir yaklaşıma işaret eder. Yapı, bu açıdan Cumhuriyet Dönemi cami mimarisinin yaygın kalıplarından farklılaşır. Bu farklılaşmanın kaynağı tarihselcilik ve bölgeselcilik ile ilişkili olarak değinilen özgün yorumlardır.

Karakaş Camii'nin tasarım kararları ardındaki kuramsal söylemin incelenmesi sonucunda tasarım sürecindeki iç tutarlılık ortaya çıkmaktadır. Plan şeması, kütle organizasyonu, ölçek, malzeme ve tekniğe ilişkin tasarım kararları, Cansever'in tanımladığı çerçevede İslâm mimarisinin bilinçli yorumlarıdır. Söz konusu İslâm mimarisi yorumu plan şemalarının doğrusal bir gelişim çizgisine oturtulmadığı, dolayısıyla teknolojik ölçütler bakımından birbirleri karşısında hiyerarşik üstünlük kurmadıkları düşüncesini benimser. Bu sebeple tarihin herhangi bir aşamasında üretilmiş bir plan şeması zaman üstü bir standart olarak kabul edilmemiştir. Böylece Cansever bağlama özgü tarihî biçim referanslarını ve ölçek tercihlerini daha geniş bir yelpazede yapabilmektedir. Karakaş Camii örneği, bir Cumhuriyet Dönemi camisi olarak, Klasik Osmanlı Dönemi yerine Beylikler ile Erken Osmanlı dönemlerine bilinçli olarak gönderme yapan özgün bir örnektir. Zaman-zemin hassasiyeti içerisinde Klasik Osmanlı mimarisi İmparatorluğun en güçlü döneminde İstanbul ölçeğinde anlamlı olduğundan, Cansever'e göre, Kaleiçi Antalyası bağlamında bir zemine oturan Karakaş Camii için farklı bir ölçek ve zaman referansının geçerli olması gerekir.

Cansever'in tarihselcilik ve bölgeselcilik ile ilişkilendirilen tasarım yaklaşımını kendi deyimiyile zaman – zemin arakesitinde Karakaş Camii özelinde inceleyen bu çalışma bu eserin önemini bir kez daha ortaya koymaktadır. Basında kendisinden bilge mimar (Cansever, 2004; Çimrin, 2015; Yücel, 2018) olarak bahsedilen, günümüzde adına uluslararası mimari tasarım yarışmaları düzenlenen (13) Turgut Cansever'in Antalya'daki tek eseri olan Karakaş Camii'ni tanımak, biçimsel özelliklerinin ardındaki tasarım düşüncesini anlamak önemlidir. Böylece tasarımcının yaklaşımını özgünlükleri ile kavramayı engelleyen genellemelerin ötesine geçerek tasarım düşüncesini doğru bir zemine oturtmak mümkün olacaktır.

KAYNAKLAR

- AMAN, F. (2018) Turgut Cansever Düşüncesinde Zihniyet-Şehir İlişkisi, *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 7(2) 1240-50.
- ANTALYA K.V.K.K. (2010) Antalya Kültür Varlıklarını Koruma Kurulu 22.03.2010 tarihli ve 2 sayılı karar; Antalya Kültür ve Tabiat varlıklarını Koruma Bölge Kurulu Müdürlüğü, Sayı No: B.16.0.KTV.0.4.07.001.136-39d.
- ANTALYA K.V.K.K. (1990) Antalya Kültür Varlıklarını Koruma Kurulu 28.02.1990 tarih ve 701 sayılı kararı.

- ARKİTEKTUEL (2017) *Demir Tatil Köyü*. [<https://www.arkitektuel.com/demir-tatil-koyu/>] Erişim Tarihi (05.12.2022).
- ARKİTERA [Arkitera Dergisi] (2022) *Büyükada Anadolu Kulübü İstanbul Büyükada Şubesi*. [<https://www.arkitera.com/proje/buyukada-anadolu-kulubu-anadolu-kulubu-istanbul-buyukada-subesi/>] Erişim Tarihi (05.12.2022).
- ARNOLD, D. (2004) Reading the Past, What is Architectural History?, *Reading Architectural History*, Routledge, London & New York; 1-13.
- ASLANAPA, O. (2007) *Türk Sanatı*, Remzi Kitabevi, İstanbul.
- AYDIN, M. (1997) Cansever, Turgut, *Eczacıbaşı Sanat Ansiklopedisi, Cilt 1*, YEM Yayınları, İstanbul.
- BOZDOĞAN, S. (1981) Tarih, Mimarlık Tarihi ve Bazı Kavramlar, *Mimarlık* 81(3) 7-11.
- BOZDOĞAN, S. (1990) Türkçe Baskıya Önsöz, *Mimari Eleştiri Yazıları*, çev. A. Cengizkan, Şevki Vanlı Mimarlık Vakfı Yayınları, Ankara; i-vii.
- BUCHANAN, P. (1983) With Due Respect: Regionalism, *The Architectural Review* (May) 15-6.
- BURCKHARDT, T. (2009) Art of Islam, Language and Meaning, *İslâm Sanatı, Dil ve Anlam*, çev. T. Koç (2019) Klasik Yayınları, İstanbul.
- CAN, A., DOĞAN, M. (2017) *Bir Şehir Kurmak, Turgut Cansever'le Konuşmalar*, Klasik Yayınları, İstanbul.
- CANIZARO, V.B. (2007) Introduction, *Architectural Regionalism: Collected Writings on Place, Identity, Modernity and Tradition*, ed. V.B. Canizaro, Princeton Architectural Press, New York; 16-34.
- CANSEVER, T., HANCI, A. (1959) Anadolu Klübü Binası (Büyükada), *Arkitekt* (295) 45-52.
- CANSEVER, T. (1966). Türk Tarih Kurumu Binası, *Mimarlık* (12) 25-27.
- CANSEVER, T. (2004) Bilge Mimar Turgut Cansever TRT "Yıllar Yollar Yüzler" Belgeseli, [<https://www.youtube.com/watch?v=85OX3w3BO4c>] Erişim Tarihi (09.04.2020).
- CANSEVER, T. (2009) *İslâm'da Şehir ve Mimari*, Timaş Yayınları, İstanbul.
- CANSEVER, T. (2010a) *Mimar Sinan*, Klasik Yayınları, İstanbul.
- CANSEVER, T. (2010b) *Kubbeyi Yere Koymamak*, Timaş Yayınları, İstanbul.
- CANSEVER, T. (2010c) *Osmanlı Kenti, Şiir'den Şehir'e*, Timaş Yayınları, İstanbul.
- CEYHAN, S. (2013) Zühd, *Türkiye Diyanet Vakfı İslâm Ansiklopedisi*, Cilt 44, İstanbul;530-33.
- COLQUHOUN, A. (1996a) Three Kinds of Historicism, *Theorizing a New Agenda for Architecture, An Anthology of Architectural Theory 1965-1995*, ed. K. Nesbitt, Princeton Architectural Press, New York; 202-10.
- COLQUHOUN, A. (1996b) Critique of Regionalism, *Casabella* (January-February) 50-5.
- COLQUHOUN, A. (1997) The Concept of Regionalism, *Postcolonial Space(s)*, ed. G. Baydar Nalbantoglu, W.C. Thai, Princeton Architectural Press, New York; 13-23.

- ÇİMRİN H. (2015) *Antalyalı "Bilge Mimar" Turgut Cansever*, [https://www.sabah.com.tr/akdeniz/2015/05/18/antalyali-bilge-mimar-turgut-cansever] Erişim Tarihi (28.06.2018).
- DEMİRGÜÇ, U. (2006) *Mimarlıkta Eleştirel Bölgeselcilik ve Turgut Cansever*, yayınlanmamış Yüksek Lisans Tezi, Fen Bilimleri Enstitüsü, İstanbul Teknik Üniversitesi, İstanbul.
- DENİZ, F. (2009) Sanat Tarihine Mimarlıktan Bakmak: Turgut Cansever ve Doktora Tezi, *Türkiye Araştırmaları Literatür Dergisi*7(13) 435-60.
- DENİZ, F. (2020) 'Velhasıl Bir Doçentlik Tezi Yazdım!' Turgut Cansever'in Modern Mimarlığın Temel Meseleleri'nin Hikayesi, *Dîvân Disiplinlerarası Çalışmalar Dergisi* 24(48) 127-59.
- DREXLER A., HINES T.S. (1982) *The Architecture of Richard Neutra*, MoMA, New York.
- DİVLELİ, M.K. (2013) Geçmişten Günümüze Cami Mimarisi, Cami Mimarisinde Etkin Güç olarak Dönemsel Aktörler, 1. *Ulusal Cami Mimarisi Sempozyumu, Camilerin Sosyal Yaşamındaki Yeri ve İşlevi* (2-5 Ekim 2012) der. H. Tokay vd., Mimar Sinan Güzel Sanatlar Üniversitesi, İstanbul; 105-14.
- DÜZENLİ, H.İ. (2009) Turgut Cansever, *İslâm Araştırmaları Dergisi* (22) 160-81.
- DÜZENLİ, H.İ. (2016) Turgut Cansever, *Türkiye Diyanet Vakfı İslâm Ansiklopedisi*, Cilt 1, İstanbul;249-50.
- DÜZENLİ, H.İ. (2019) *İdrak ve İnşa, Turgut Cansever Mimarlığının İki Düzlemi*, Klasik Yayınları, İstanbul.
- EKİNCİOĞLU, M. (2001) (editör) Karatepe Açık Hava Müzesi, Türk Tarih Kurumu, Demir Evleri, Sualtı Arkeoloji Enstitüsü, Karakaş Camisi, *Turgut Cansever, Çağdaş Türkiye Mimarları Dizisi 1*, Boyut Yayınları, İstanbul, 25-30, 63-8, 135-9, 141-50.
- ERKİLİÇ, M. (1998) Legitimization of the Regionalist Idea in Architecture through Mumford's Early Writings, *ODTÜ Mimarlık Fakültesi Dergisi* 18 (1-2) 5-23.
- ERTUĞRUL, Z. (2020) Antalya Karakaş Cami ve Günümüz Cami Tasarımları İçindeki Yeri, *Canan Parla Armağanı, Sanat Tarihi, Arkeoloji, Tarih ve Filoloji Araştırmaları*, der. E. Altınsapan, B.Y. Olcay Uçkan, Doğu Kütüphanesi Yayınları, İstanbul; 157-74.
- ERZEN, J. (1996) *Mimar Sinan, Estetik bir Analiz*, Şevki Vanlı Mimarlık Vakfı Yayınları, Ankara.
- ERZEN, J. (2006) *Çevre Estetiği*, ODTÜ Yayıncılık, Ankara.
- EYAPAN, G.A. (1991) Zaman-Mekan Bağlamında Kalıcılık, *Arredamento Dekorasyon* (29) 92-3.
- FLETCHER, B. (1905) *A History of Architecture, On the Comparative Method*, Bradbury Agnew & Co. Ld. Printers, London.
- GÜRALLAR, N. (2015) Tarihselcilik – Tarihsicilik [Historicism]: Bir Mimarlık Terminoloji Tartışması ve 2000'ler Türkiyesinde Tarihsicilik Mimarlık, *ODTÜ Mimarlık Fakültesi Dergisi*, 32(2) 191-204.
- GÜNAY, R. (2014) *Mimar Sinan*, YEM Yayınları, İstanbul.

- GÜRER, M. (1997) *Turgut Cansever, An Alternative Position: Architectural Regionalism in Turkey in 1980s*, yayınlanmamış Yüksek Lisans Tezi, Fen Bilimleri Enstitüsü, Orta Doğu Teknik Üniversitesi, Ankara.
- HARTMANN, N. (1942) *New Ways of Ontology, Ontolojide Yeni Yollar*, çev. L. Yarbaş (2001) İlya Yayınevi, İzmir.
- HILLENBRAND, R. (1999) *Islamic Art and Architecture İslâm Sanatı ve Mimarlığı*, çev. Ç. Kafescioğlu (2005) Homer Kitabevi, İstanbul.
- INA [Institute of Nautical Archaeology] (2022) *Bodrum Sualtı Arkeoloji Müzesi*. [<https://nauticalarch.org/bodrum-arastirma-merkezi/>] Erişim Tarihi (05.12.2022)
- KUBAN, D. (2010) *Batıya Göçün Sanatsal Evreleri*, Türkiye İş Bankası Kültür Yayınları, İstanbul.
- KUBAN, D. (2013) *Davetli Konuşma, 1. Ulusal Cami Mimarisi Sempozyumu (2-5 Ekim 2012)* der. H. Tokay vd., Diyanet İşleri Başkanlığı Yayınları, Ankara; 24-27.
- LEACH, A. (2010) *What is Architectural History?, Mimarlık Tarihi Nedir?*, çev. H. Doğan (2015) Koç Üniversitesi Yayınları, İstanbul.
- LEFAIVRE, L., TZONIS, A. (2003) *Critical Regionalism: Architecture and Identity in a Globalized World*, Prestel, Michigan.
- MENGÜŞOĞLU, T. (1976) *Fenomenoloji ve Nicolai Hartmann*, İstanbul Üniversitesi Yayınları, İstanbul.
- MİMARLAR ODASI ANTALYA ŞUBESİ (2020) *Kepez Belediyesi Turgut Cansever Uluslararası Mimarlık Ödülleri (2020)* [<http://www.antmimod.org.tr/kepez-belediyesi-turgut-cansever-uluslararasi-mimarlik-odulleri-2020>] Erişim Tarihi (14.02.2021)
- MÜLAYİM, S. (2004) *İslâm Sanatı, Büyük Bildirinin Göstergeleri*, İSAM Yayınları, Ankara.
- NESBITT, K. (1996) *Introduction, Theorizing A New Agenda For Architecture, An Anthology of Architectural Theory 1965-1995*, ed. K. Nesbitt, Princeton Architectural Press, New York; 16-71.
- NORBERG-SCHULZ, C. (1980) *Genius Loci, Towards a Phenomenology of Architecture*, Rizzoli, New York.
- ÖZKAN, S. (1989) *Regionalism within Modernism, Space for Freedom*, ed. İ. Serageldin, Butterworth Architecture, London; 8-16.
- ÖZLEM, D. (2018). *Tarihselci Gelenek: Dilthey-Weber-Gadamer*, Notos Kitap, İstanbul.
- PALLASMAA, J. (1996) *The Eyes of the Skin, Tenin Gözleri, Mimarlık ve Duyular*, çev. A. Ufuk Kılıç (2011) YEM Yayınları, İstanbul.
- PALLASMAA, J. (1988). *Tradition and Modernity: The Feasibility of Regional Architecture in Post-Modern Society*, *The Architectural Review*, 176 (6) 26-34.
- PANOFSKY, E. (1996), *Perspective as Symbolic Form, Perspektif: Simgesel Bir Biçim*, çev. Y. Tükel (2013) Metis Yayınları, İstanbul.
- PAVLIDES, E. (1991) *Four Approaches to Regionalism in Architecture, Critical Regionalism: The Pomona Meeting Proceedings*, ed. S Amourgis

College of Environmental Design, California State Polytechnic University, Pomona California; 305-321.

- PEKER, A.U. (2013) Mimar Sinan'dan Öğrenmek: Cami Tasarımında Özgünlük Arayışına Yanıtlar, 1. *Ulusal Cami Mimarisi Sempozyumu (2-5 Ekim 2012)* der. H. Tokay vd., Diyanet İşleri Başkanlığı Yayınları, Ankara; 256-64.
- SAATÇİ, S. (2013) Camiler Her Dönemde Çağdaş Yapı Niteliğini Korumalıdır, 1. *Ulusal Cami Mimarisi Sempozyumu (2-5 Ekim 2012)* der. H. Tokay vd., Diyanet İşleri Başkanlığı Yayınları, Ankara; 146-9.
- SÖZERİ, Z. (2013) İbadet Mekanına Yolculuk ve Cennet Metaforunun Cami Tasarımına Etkisi, 1. *Ulusal Cami Mimarisi Sempozyumu (2-5 Ekim 2012)* Diyanet İşleri Başkanlığı Yayınları, Ankara; 192-8.
- SPECK, L.W. (1987) Regionalism and Invention, *Center: A Journal For Architecture in America* (3) Rizzoli, New York; 6-8.
- TANYELİ, U. (1991) İslâm Mimarlığı Kavramına Eleştirel Bir Bakış, *Ege Mimarlık*, (2) 30-31.
- TANYELİ, U. (2001) Çağdaş Mimarlıkta İslami İçerik Sorunu ve Turgut Cansever, *Turgut Cansever*, der. M. Ekincioglu, Boyut Yayın Grubu, İstanbul; 7-23.
- TANYELİ, U. (2008) *Karakaş Cami, kubbeyi tüm altyapısından koparmak, ama yine de Osmanlı'nın tüm anılarını kullanmak şeklindeki riyakarlığı mahkum ediyor.* [https://www.mimarizm.com/makale/ugur-tanyeli-karakas-cami-kubbeyi-tum-altyapisindan-koparmak-ama-yine-de-osmanli-nin-tum-anilarini-kullanmak-seklindeki-riyakarligi-mahkum-ediyor_113526] Erişim Tarihi (22.06.2020).
- TANYELİ, U. (2013) Tarihselciliğe Övgü, *Rüya, İnşa, İtiraz, Mimari Eleştiri Metinleri*, Boyut Yayıncılık, İstanbul, 105-8.
- TAŞAR, E.S. (2019) Turgut Cansever ve Mimarisinde Nazarî-Amelî İlişkisi, *Türkiye Belediyeler Birliği İller ve Belediyeler*, Ankara; 48-52.
- TTK [Türk Tarih Kurumu] (2022a) *Fotoğraflarla TTK.* [<https://www.ttk.gov.tr/belgelerle-tarih/fotograflarla-ttk/>] Erişim Tarihi (05.12.2022)
- TTK [Türk Tarih Kurumu] (2022b) *Fotoğraflarla TTK.* [<https://www.ttk.gov.tr/belgelerle-tarih/fotograflarla-ttk/>] Erişim Tarihi (05.12.2022)
- TUNALI, İ. (2012) *Tasarım Felsefesi, Tasarım Modelleri ve Endüstri Tasarımları*, YEM Yayınları, İstanbul.
- TÜMER, G. (2008) Bir Turgut Cansever Profili, *Mimarlık*, (339). [<http://www.mimarlikdergisi.com/index.cfm?sayfa=mimarlik&DergiSayi=289&RecID=1684>] Erişim Tarihi (22.06.2020).
- ÜSTÜN, B., ULUSOY, Ö.G., ŞENSOY, G., KOLSAL, F. (2019) A Designer in the Intersection of Islamic-Ottoman Architecture: the Architectural Concept of Turgut Cansever (1920-2009), *Journal of Islamic Architecture*, 5(4) 229-42.
- YÜCEL, A. (2007) Çağdaş Türkiye Mimarlığı / Tarihselciliğe Karşı Tarihsellik: Eldem, Cansever ve Çinici'nin Yapıtları Üzerinden Tematik Bir Panorama, *2000'lerde Türkiye'de Mimarlık: Söylem ve Uygulamalar*, der. T. Korkmaz, Mimarlar Odası Yayınları, Ankara; 165-73.
- YÜCEL, D.M. (2018) Bilge Mimar Turgut Cansever, *Ebabil* (3) 92-5.

Received: 18.09.2021; Final Text: 20.04.2023

Keywords: Turgut Cansever; Karakaş Mosque; Antalya; historicism; regionalism.

AN ANALYSIS OF THE DESIGN CONCEPTION OF ARCHITECT TURGUT CANSEVER IN THE CONTEXT OF THE KARAKAŞ MOSQUE IN ANTALYA, TURKEY

A significant figure of Republican Turkish architecture, Turgut Cansever (1921-2009) is distinguished not only due to the quality of his built projects but also due to his texts revealing a characteristic theoretical discourse. Through a profound interest in philosophy and art history, Cansever synthesizes Western and Islamic concepts. He argues that architecture is a discipline loaded with existential meanings beyond the limitations of a technical profession.

This study analyses the reflections of Cansever's theoretical discourse on the design of the Karakaş Mosque in Antalya, Turkey. This project was realized during Cansever's late career, underlined by mature and systematic interpretation of traditional forms. Besides, this building is Cansever's only work in Antalya, his birthplace. Moreover, it is the only built mosque designed by the architect who refers to Islamic concepts frequently. Therefore, the conceptual analysis of the building's design decisions deserves scrutiny. Academic sources problematizing the relation between Cansever's conceptual arguments and his designs generally associate the architect's work with historicism and regionalism. Thus, this study departs from a general discussion of the relationship of Cansever's projects with these movements in order to establish a conceptual basis for discussing the design of the Karakaş Mosque. Finally, the conceptual causes for the architect's decisions are discussed in terms of plan scheme, spatial organization, scale, construction materials and techniques.

MİMAR TURGUT CANSEVER'İN TASARIM DÜŞÜNÇESİ ÜZERİNE ANTALYA KARAKAŞ CAMİİ BAĞLAMINDA BİR ÇÖZÜMLEME

Cumhuriyet dönemi Türk mimarlığının önde gelen figürlerinden olan Turgut Cansever (1921-2009) sadece inşa edilmiş projelerinin niteliği sebebiyle değil, aynı zamanda karakteristik bir kuramsal söylemi açığa çıkaran metinleri dolayısıyla ayrıcalıklı bir konuma sahiptir. Cansever, felsefe ve sanat tarihine olan derin ilgisi sayesinde, Batı ve İslam kaynaklı kavramları sentezler. Cansever, mimarlığın teknik bir mesleğin sınırlarının ötesine geçen, varoluşsal anlamlar ile yüklü bir disiplin olduğunu savunur.

Bu çalışma, Cansever'in kuramsal söyleminin Antalya'da bulunan Karakaş Camii tasarımı üzerindeki yansımalarını çözümlemektedir. Bu proje, Cansever'in kariyerinde geleneksel biçimlerin olgun ve sistematik yorumlanmalarının önem kazandığı geç dönemde gerçekleşmiştir. Bununla birlikte, bu yapı Cansever'in doğum yeri olan Antalya'da bulunan tek eseridir. Ayrıca, Karakaş Camii, İslamî kavramlara sıklıkla atıf yapan mimarın tasarımları arasında inşa edilmiş olan tek camidir. Bu sebeplerden dolayı, söz konusu tasarımın kavramsal çözümlemesi ayrı bir önem kazanmaktadır. Cansever'in kavramsal argümanları ve tasarımları arasındaki ilişkiyi sorunsallaştıran akademik kaynaklar genellikle mimarın eserlerini tarihselcilik ve bölgeselcilik ile ilişkilendirir. Dolayısıyla, Karakaş Camii tasarımı değerlendirilmek için bir kavramsal altyapı oluşturmak üzere, bu makalede Cansever'in projelerinin söz konusu akımlar ile ilişkileri üzerine genel bir tartışmadan hareket edilmektedir. Sonuç olarak, mimarın tasarım kararlarının kavramsal sebepleri plan şeması, mekânsal organizasyon, ölçek, yapı malzemeleri ve teknikleri bakımından tartışılmaktadır.

KEMAL REHA KAVAS; B.Arch., M.Arch., PhD.

Received his B.Arch and M.Arch degrees from the Department of Architecture at METU (2002, 2005); his PhD. degree in history of architecture from METU in 2009. Major research interests include theory and historiography of architecture, environmental aesthetics and vernacular architecture. kemalkavas@akdeniz.edu.tr

SERKAN KILIÇ; B.A., M.A. PhD.

Graduated from Anadolu University, Faculty of Arts and Letters, Department of Art History (2010). Received his MA (2012) and PhD. (2019) degrees in art history from Akdeniz University. Major research interests include Turkish-Islamic architecture, Anatolian-Turkish Architecture and Ottoman Architecture in the Balkans. serkankilic@akdeniz.edu.tr



ISSN 0258531-6



9 770258 453100 7